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CANADIAN GEOGRAPHICAL JOURNAL

Frank S. Panabaker, A.R.C.A.

Mallards over Lake

Published by THE ROYAL CANADIAN GEOGRAPHICAL SOCIETY

THE ROYAL CANADIAN GEOGRAPHICAL SOCIETY

OTTAWA, CANADA

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As one of its major activities in carrying out its purpose, the Society publishes a monthly magazine, the Canadian Geographical Journal, which is devoted to every phase of geography — historical, physical and economic — of Canada, of the British Commonwealth and of the other parts of the world. It is the intention to publish articles in this magazine that will be popular in character, easily read, well illustrated, and informative.

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At a special general meeting of the Society, held on Friday, 4 October 1957, under the chairmanship of the President, Major-General H. A. Young, a resolution was passed unanimously by the members approving the necessary By-Law to change the name of the Society to "The Royal Canadian Geographical Society", and application to the Secretary of State for supplementary Letters Patent to effect this change has been duly made, in accordance with the provisions of the Society's By-Laws and the requirements of the Companies Act. This was granted as of 4 October 1957.

E. S. Martindale

E. S. Martindale
Honorary Secretary

CANADIAN GEOGRAPHICAL JOURNAL

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THE ROYAL CANADIAN GEOGRAPHICAL SOCIETY

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This magazine is dedicated to the presentation in authentic and popular form, with extensive illustrations, of the broad pattern of Canadian life and its industrial, physical, and cultural foundations.

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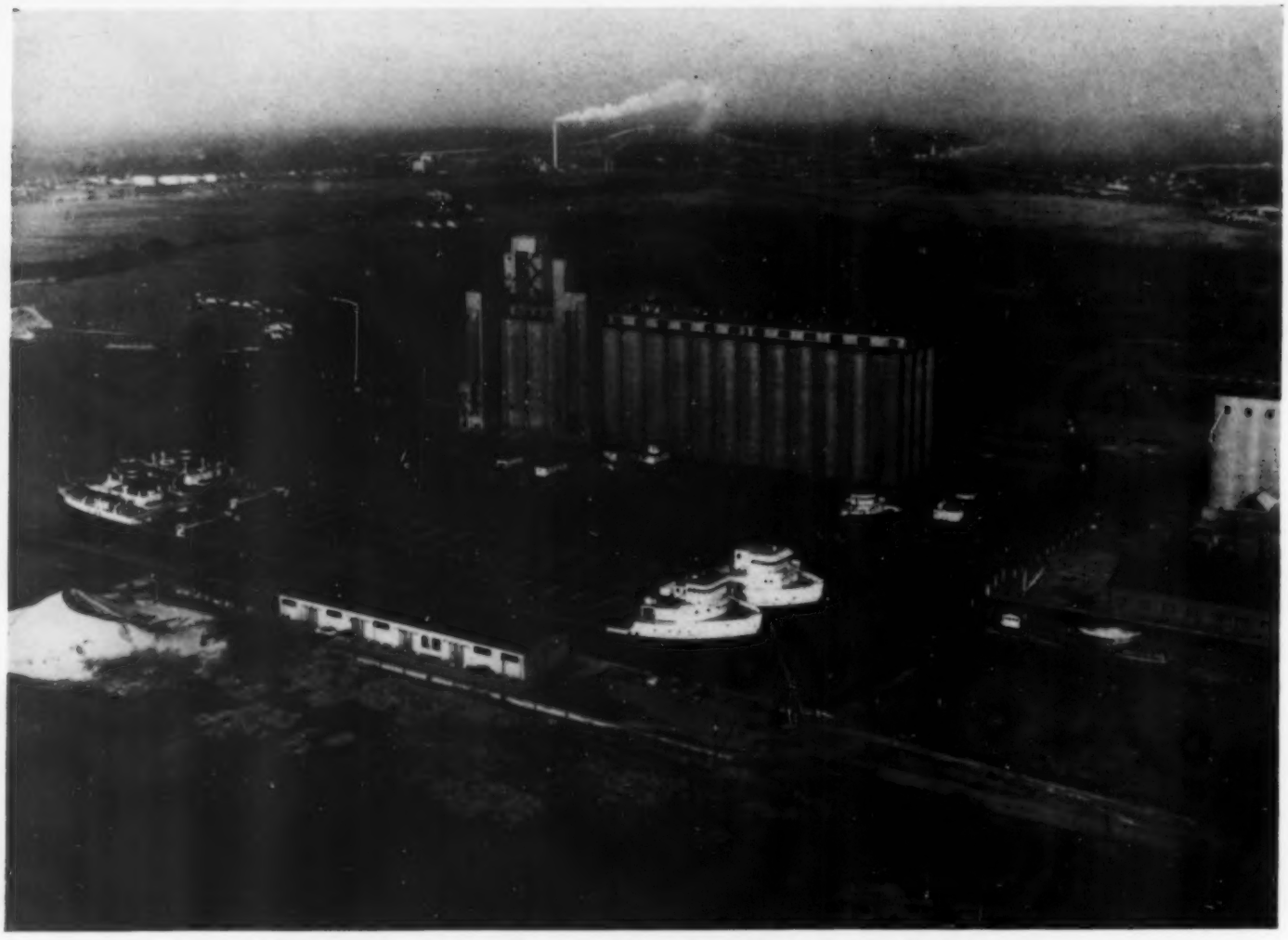


Sarnia serves as winter quarters for some of the largest freighters of the Great Lakes. These, loaded with storage grain, are berthed for the winter. Behind them rise the grain elevators and in the distance is the Bluewater International Bridge. Between the elevators and the bridge lies the main winter harbour.

Sarnia, Canada's "Chemical Valley"

by JEAN ELFORD

SARNIA lies at the foot of Lake Huron in south-western Ontario, where the lake flows into the St. Clair River. One of the most southerly of all Canadian cities, it is located at the cross-roads of the land and water transportation systems of the heavily industrialized mid-continent. Opposite to it is the American city of Port Huron. Sixty miles to the east is London; sixty miles to the west is Flint; sixty miles to the south is Detroit.

Sarnia is located midway on the world's largest freshwater navigation system, the St. Lawrence Seaway. One of the heaviest tonnage ports on the Great Lakes, it is a shipping point for a rich industrial and agricultural region. As the industry of the city itself has expanded, more and more ships have taken on and discharged cargoes at her port. In 1956 2,006 vessels called at Sarnia. Some also berthed here for the winter, loaded with storage grain.

There is a steady flow of river traffic by the city from early spring till December. Last year the ships went by at the rate of about eighty-three every twenty-four hours — 21,269 all

told. Among them were the bulk freighters over 600 feet long, about seventy feet wide and thirty-five feet deep, carrying cargoes of coal, iron ore, grain, gypsum, or crushed stone. Also passing were the smaller package freighters and oil tankers. There were little ocean tramps, too, flying the flags of Norway, Sweden, France and other northern European countries. Many of these took on cargoes of synthetic rubber at Sarnia. Passenger boats, although not as many as in former years, made up part of the flow of traffic.

It is a fine sight, from down-town Sarnia, to see these passenger steamers going by on the river, riding high and proudly on the water. At night they are beautiful, with lights shining from the portholes at the water-line, from along the decks and up on the spars. Along the city's waterfront can be heard the music of their ballroom orchestras, the muffled throb of their engines and the mellow, deep toned salutes of their steam whistles.

Many, many boats, from schooners and steam driven paddle-wheelers to new diesel-powered freighters, have called at Sarnia; but except for Indian canoes the first to seek the shelter of her harbour was a sailing vessel named *Le Griffon*, built by La Salle for fur-trading on the Great Lakes. In August 1679 he anchored in Sarnia Bay for the night, before going out on Lake Huron. To this day ships stay in the river when fog or heavy storms make it hazardous to venture out on the lake.

With La Salle besides his sailors on that first sailing voyage of the upper lakes was Father Hennepin, a Jesuit priest. This devout man named the river and the small lake at its mouth Ste. Claire in honour of a saint whose name-day it was when the river and lake were first sailed upon.

The river channel is narrow at the point where the lake flows into it and the water very rapid. This swift-flowing water gave rise to Sarnia's early name, "The Rapids" or the French "La Chute". This name was changed to Sarnia in January 1836 by Sir John Colbourne, Lieutenant-Governor of Upper Canada. Sarnia was the Latin name for Guernsey in the Channel Islands, where Colbourne had been Lieutenant-Governor at one time.

When Sarnia was named it was a small port of about one hundred inhabitants. At that time Lambton County of which Sarnia is the county seat was covered with a hardwood forest of

Traffic along the St. Clair River past Sarnia is heavy. View north, showing Port Huron, Michigan, on the west side of the river and Sarnia on the east side.

Sarnia Chamber of Commerce photographs

oak, maple and walnut. These hardwoods were taken to Sarnia to be shipped. Loads of squared oak timbers went from here to England by sailing vessel. As the county was cleared Sarnia became a source of manufactured articles for the farming communities that were formed nearby. Some of the businesses established at that time are still in operation. Among them are the King Milling Company, the Lambton Loan and Investment Company, and Mackenzie and Milne's Hardware.

One of the earliest businesses of all was shipbuilding. The most ambitious venture in this line was the building of a wooden passenger vessel in 1882. This ship was called *The United Empire*. A picture of her passing up the St. Mary River was printed on Canada's four dollar bills, circulated over fifty years ago. For many years there was no shipbuilding at Sarnia except during the Second World War, when *Fairmiles* were built at the Mac Craft factory.

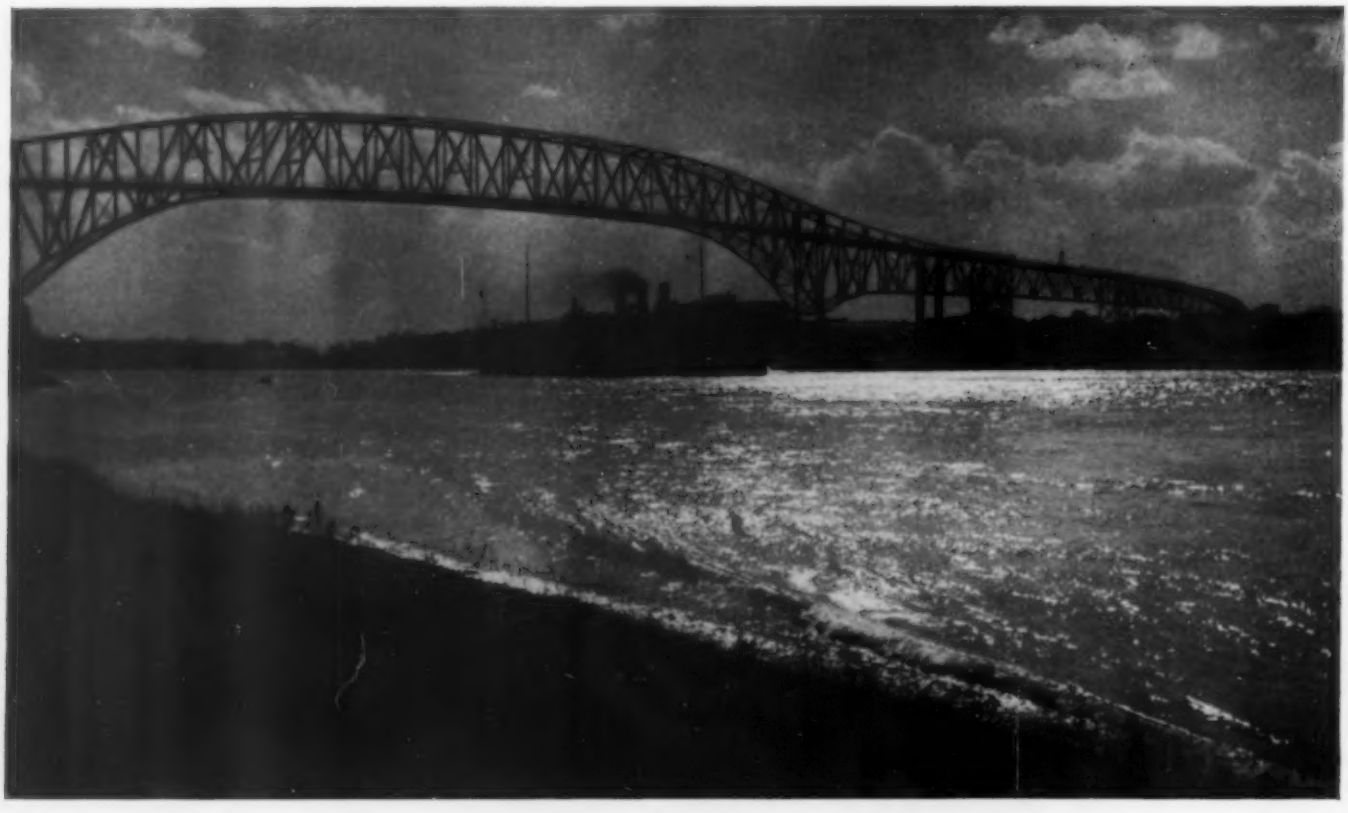
By 1852 Sarnia had railroad as well as shipping facilities. In that year the Grand Trunk Western (now part of Canadian National Railways) extended its line from London to Sarnia to link up with the American line from Port Huron, Michigan to Chicago. Ever since, there has been daily service from Montreal to Chicago by this route.

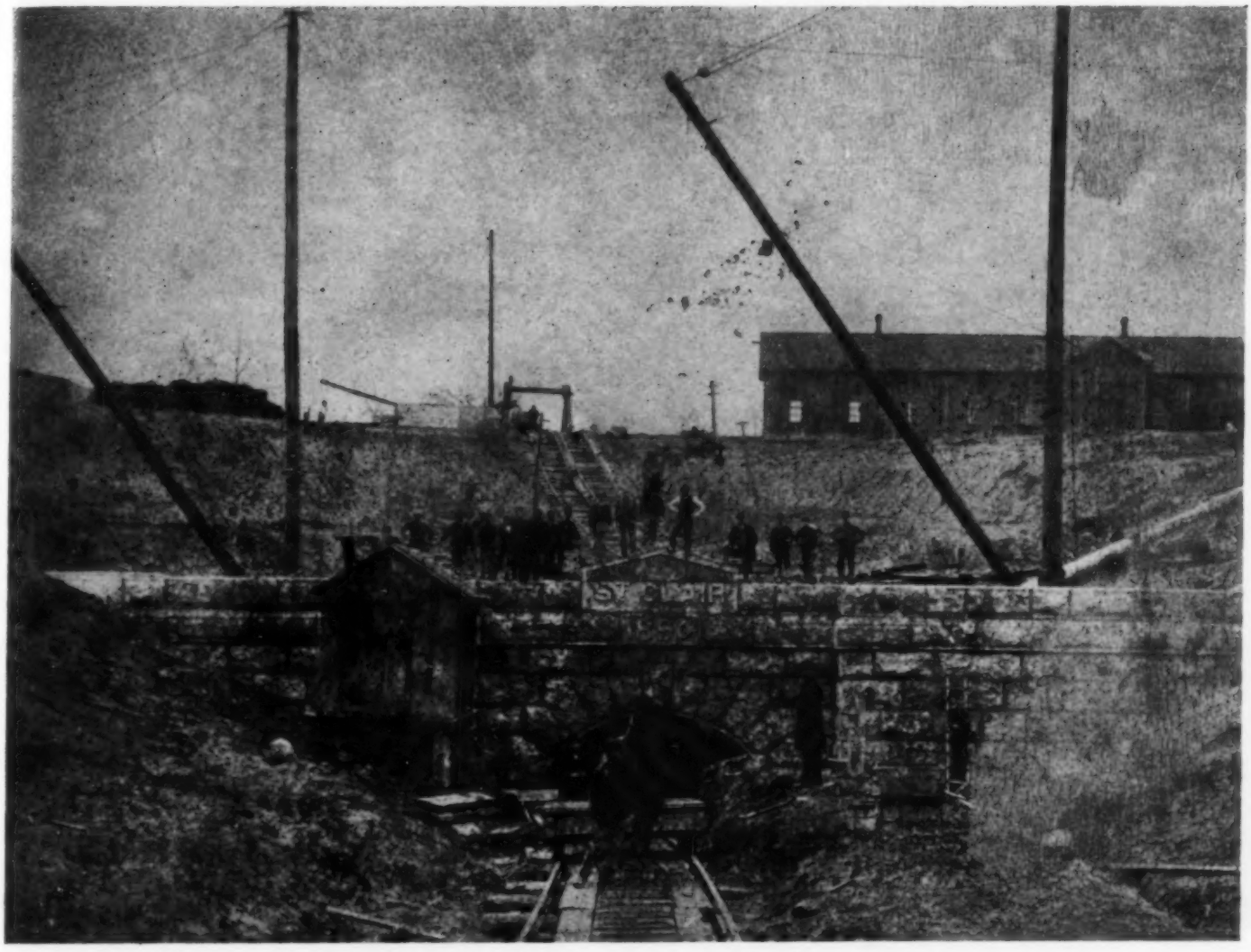
At first the Chicago-bound trains coming into Sarnia were ferried across the St. Clair River by car ferry. This was a relatively slow procedure at best; but during the winter, when a channel had to be kept open through the ice, and in times of stormy weather, it meant long delays and inconveniences.

To overcome these difficulties the first international submarine tunnel in the world was built under the St. Clair River bed. This great engineering accomplishment was proposed and directed by a Grand Trunk engineer named Joseph Hobson. Costing $2,700,000, the tunnel is 6,000 feet long and a little over fifteen feet in diameter.

From the time the tunnel was finished in September of 1891 till the year 1907, the regular steam-engines hauled the trains through to Port Huron. But these created so much smoke and dust in the confined space that they were replaced by specially built electric engines —

A view of the Bluewater International Bridge over the St. Clair River.
Sarnia Chamber of Commerce





Late in the nineteenth century the St. Clair River tunnel was completed. It was the first international submarine tunnel in the world. This photograph was taken when work was in progress.

the first electrically powered tunnel engines in the world. Electric engines are still used for freight trains, but diesels are now used for the entire Montreal-Chicago run on passenger trains.

Car ferries are used for taking the freight cars of the Chesapeake and Ohio Railway across the river. Two ferries with engines fore and aft ply the river continuously bringing freight from Michigan to Ontario, thus speeding up its passage to Buffalo and New York. (This freight goes south to Chatham.) Freight also comes in and out by Canadian National Railways from St. Mary's to Point Edward on the edge of the city. There it is stored in large sheds until it can be taken away by boat. These railways handle 1,600 freight cars a day. Canadian National Railways has large yards and a thirty-stall round-house for locomotives.

As well as boat and rail facilities, Sarnia is served by good highways. Running east out of the city is the highway to London, equipped with overpasses, which is the three-lane type for one-third of the way. North and south from the city the scenic Bluewater Highway follows along the St. Clair River and Lake Huron. Running south-east from the city is a road familiarly known as "The Plank". "The Plank" was originally built with oak planks six inches thick and ten feet long. It was laid from Sarnia to Lambton County's early oil fields twenty miles away, so that the crude oil could be hauled by teams to Sarnia for shipment. The road was for many years maintained

50

by tolls. One of the toll-gates near the edge of the city was staffed to stop all vehicles and collect tolls as recently as 1927.

Until 1939, to go west out of Sarnia one either went across the river on a ferry or under the river on a train through the tunnel. In that year the Bluewater International Bridge over the St. Clair River between Sarnia and Port Huron was opened. This bridge of cantilever construction arches high above the river, with long approaches over the land at both ends. From the centre of it one can look down on the long lake freighters, out over the wide reaches of Lake Huron, far over the roof tops of Port Huron and Sarnia, and along the St. Clair toward the great industrial plants.

Traffic over the bridge is heavy. Last year 1,163,732 vehicles used this route between Ontario and Michigan. Two hundred trucks cross it daily. It takes only thirty-six hours for a transport to go from Sarnia to Winnipeg using the bridge into the United States, a good deal less time than by using the Canadian route.

Well served by boat, rail and highway, Sarnia is now building an airport. At present Sarnians go to London or Detroit, sixty miles either way, for air transportation. Air service will be a boon to this busy centre where so many travellers are coming and going: Sarnia is a gathering place of scientists, chemists and engineers. They come from as far away as France, South America and the Netherlands East Indies to study methods and exchange ideas on scientific work.

Sarnia's destiny as the home of the biggest oil refinery in Canada and second biggest in the British Commonwealth was decided by her nearness to Lambton's early oil fields and her favourable shipping position on the Great Lakes. In 1857 the first oil well on the North American Continent went into production at

Top left:—Sarnia is linked to other centres by good highways. A section of the highway to London, showing one of the overpasses.

Ontario Department of Highways

At bottom:—
Sarnia is one of the heaviest tonnage ports on the Great Lakes. A view of the city's fine harbour in winter, with ships of the Imperial Oil Company's fleet moored for the season.

The towering units and complex equipment of a modern oil refinery often take up to a year to design. Here, at Imperial Oil's Sarnia plant, draftsmen help design refineries of the future.

Oil Springs. Refineries were built to refine the crude at London, Petrolia and Sarnia. Several of the early refineries from the area merged together to form Imperial Oil, which purchased its Sarnia refinery in 1897. At first the refinery which now processes 80,000 barrels of crude daily was supplied with 900 barrels. A sixteen-mile pipeline to Petrolia was the early counterpart of the 1,770-mile supply line of today. Early products numbered three — kerosene, axle grease and harness oil. Today they number over 600.

By 1914 the supply of Lambton's crude was no longer adequate to the demand for gasoline that the automobile had created. A pipeline to Cygnet, Ohio was laid and a tanker fleet built to bring in the 30,000 barrels of crude that were needed daily.

Expansion and modernization have been continuous since the discovery of the large oil wells in Alberta in 1947. Four tankers 620 feet long were built to bring the western crude from the end of the pipeline at Superior, Wisconsin. A larger dock was built on the river-front to accommodate the big boats. A new crude oil tank farm — acres of land devoted to huge white storage tanks — was added to the refinery, as well as a 53,000-barrel-a-day atmospheric and vacuum distillation unit, a 19,000-barrel-a-day fluid catalytic cracking unit and a light ends plant. With the completion of the pipeline to Sarnia and the products line to Toronto through London and Hamilton, Sarnia became the major link between western oil and eastern consumers.

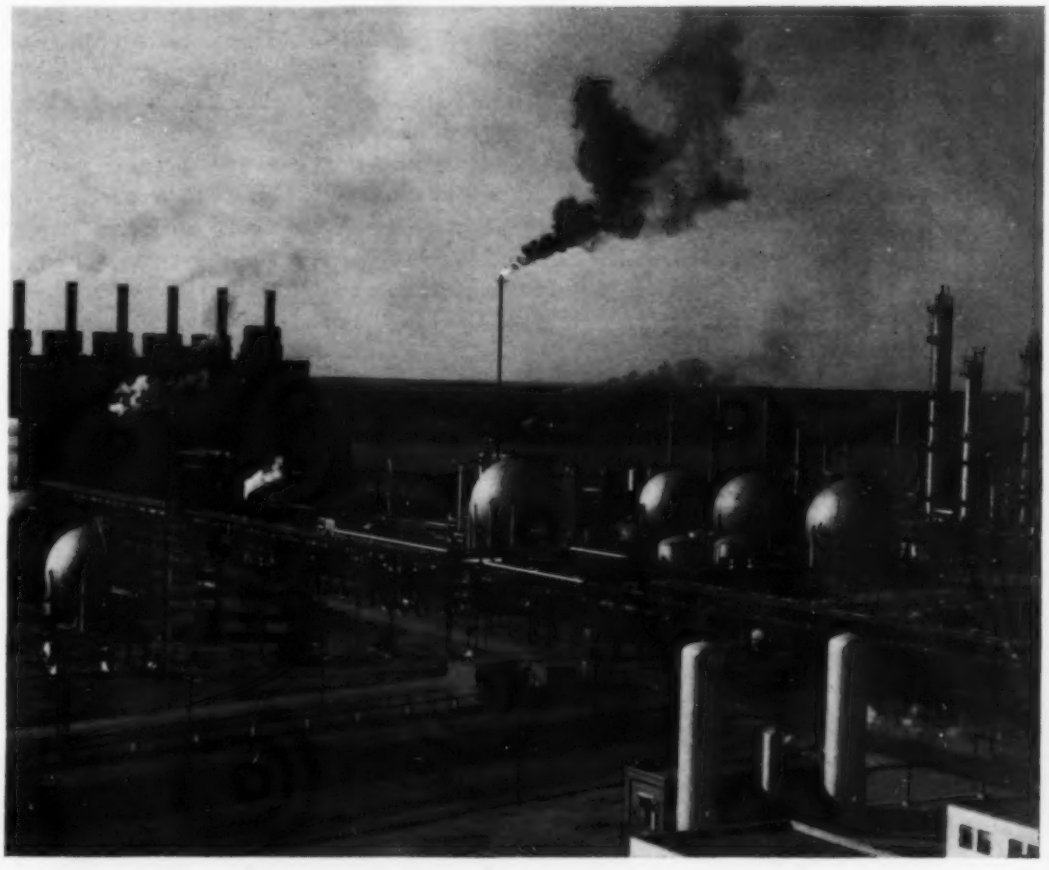
Now Imperial Oil has launched into the petro-chemical field on a large scale. A $5,000,-000 plant is being built to make detergent

alkylate, a main ingredient of household detergent. When the plant starts production this fall, it will make Canada self-sufficient in this chemical which is now imported. A much bigger undertaking is the $28,500,000 petro-chemical plant under construction on fifty acres of land to the south of the Imperial Oil refinery. This plant will produce chemicals like ethylene, propylene and butadiene for the use of other industries which will undoubtedly spring up and turn its output into plastics, anti-freeze and other synthetic products.

The wartime need for rubber brought Sarnia her next big industry. When the Japanese cut off the supply of natural rubber by capturing the Asiatic plantations, the Canadian Government established the Polymer Corporation to manufacture the synthetic product. Sarnia was chosen as the location for the plant because Imperial Oil had a pipeline from Ohio to bring in the crude oil that was necessary as a source of butadiene. Imperial Oil also had a highly trained staff which it would lend for consultation and training. Coal and benzene could be brought in cheaply by boat. An enormous supply of fresh cold water for processing the product flowed down the St. Clair River. Salt was readily available from the local wells. Manufacturers of rubber products were within 200 miles on direct road and rail routes.

From its incorporation in February 1942 till the first rubber was produced in September 1943, the Crown-owned company was in a state of ceaseless activity. One hundred and thirty acres of former Indian reservation, covered only with sparse scrub growth, were transformed into a maze of aluminum-coloured spheres, towers, overhead pipes and rectangular red brick buildings. Looming up beside the river were a 200-foot flare-stack and a powerhouse with six high chimneys. At the peak of the construction work 5,600 men were employed — grading, carpentering, pouring cement, brick-laying and pipe-fitting in all the turmoil of a great enterprise in the making.

After the rushed beginnings to meet the wartime needs of the allied nations, the plant expanded steadily to supply the ever-increasing demands of the peacetime markets. To search out ways of improving the product to preserve



A view of part of the plant of the Polymer Corporation Limited at Sarnia. Note the six-stack powerhouse (left) and the 200-foot flare-stack (centre).

Malak

Polymer's six-boiler steam and power plant is one of the largest of its type on the continent. It provides steam and power for the company's installations, and to some nearby industries.

Malak

its competitive position on world markets, Polymer built a modern research laboratory and intensified its research work. Now synthetic rubber is more than equal to natural rubber in wearability, air retention and in heat and oil resistance. The 270,000,000 pounds of synthetic rubber produced annually supply all Canada's needs and the remainder is shipped to nearly fifty countries around the world.

Dow Chemical of Canada, Limited came to Sarnia to help in establishing Polymer. Encouraged by the progressiveness of post-war Canada, they built a plant of their own on 300 acres of former Indian reservation along the river next to Polymer. This location was chosen because of the large salt beds underlying the site, the cold water of the St. Clair and the availability of abundant electrical power. An added inducement was the steam to be had from Polymer's power-plant. This power-plant, one of the largest in Canada, uses 1,500 tons of coal a day and produces 2,000,000 pounds of steam an hour. Dow alone sells 600 chemicals for industry and agriculture. When finally processed, they become such familiar goods as plastic toys, latex paint and antifreeze; some reach the market as weed killers, fertilizers and insecticides.

Another company benefiting from the availability of water and steam from Polymer's power-plant is Fiberglas of Canada Limited, which came to Sarnia in 1947. In their plant glass fibre for insulation for homes and industry, as well as for other products, is manufactured.

Imperial Oil was Sarnia's only refinery until oil in Alberta decided the Canadian Oil Companies to build a plant here and the general prosperity of the country induced the Sun Oil Company Limited to build a Canadian refinery. The Canadian Oil refinery uses 30,000 barrels of Redwater crude daily to make gasoline, diesel fuels and other petroleum products — among them, butylene, which it supplies to the nearby petro-chemical industries. The plant is on a 475-acre riverside site with its own power-plant, dock and tanker. Sun Oil have a plant (built in 1953) and are supplied at the present time with crude piped from Texas. Although smaller than either Imperial or Canadian Oil, it was designed to take advantage of the most up-to-date developments in refinery processes. It shares a products line to Toronto with Canadian Oil.

All the refineries are distinguished by the many aluminum-coloured storage tanks on their property. These tanks, about fifty feet high and 120 feet in diameter, hold approximately 2,000,000 gallons. In addition, there are more novel tanks in the thick salt-beds underlying this area: caverns have been washed out 2,000 and 3,000 feet below the surface to hold liquid petroleum gases. This system of storage, used by several "Chemical Valley" plants, offers safer and cheaper storage capacity

than the conventional surface tanks for the high quality and costly hydrocarbons.

Several companies closely associated with the oil industry came to Sarnia in the wake of the new refineries. The first of these was Cabot Carbon Ltd. This plant, on an eighteen-acre site close to Polymer, manufactures 55,500,000 pounds of oil furnace carbon black annually for the use of the rubber industry. An ordinary passenger car's tire contains about four pounds of this carbon black, an ingredient which will multiply its wearability by ten. Until Cabot Carbon started to produce in 1952, all carbon black had to be imported; the Sarnia plant is the only one of its kind in Canada.

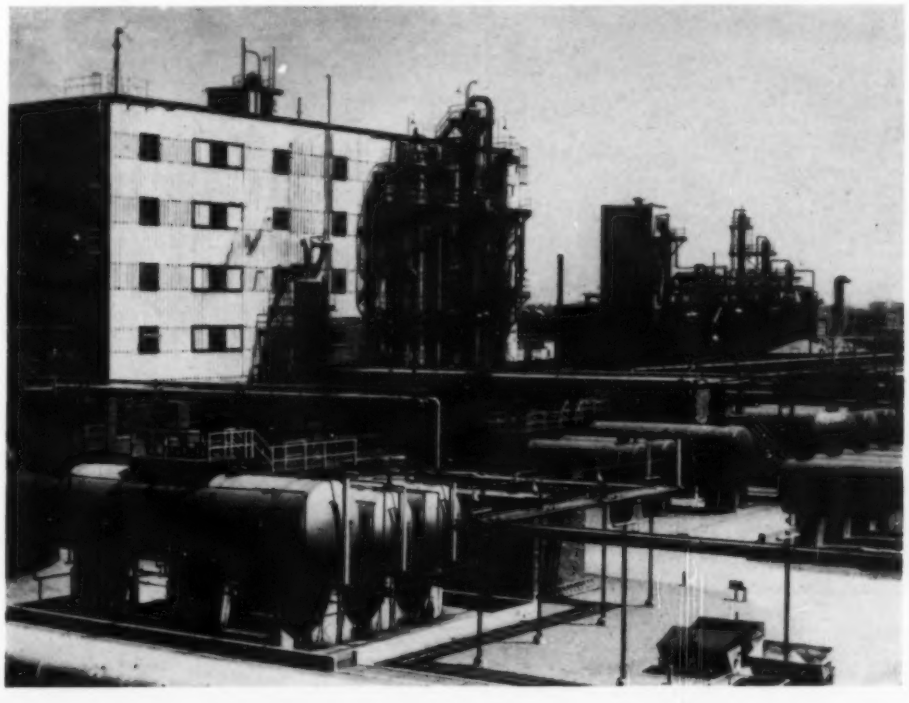
Another plant unique in Canadian industry is the Ethyl Corporation of Canada Limited, which came to Sarnia very recently to make tetra-ethyl lead. This compound is used by the oil refineries to improve the anti-knock property of their gasolines. Enough of the product is made in this plant to fill all Canadian needs.

In August, Du Pont of Canada announced that it plans to build a plant near Sarnia to make linear polyethylenes, a type of plastic which is new to Canada and involves the polymerization of ethylene. Engineering design of the plant is under way. The new polyethylenes will make possible improved moulded products such as sterilizable bottles and laboratory equipment, packaged food that can be boiled in the package, rigid and high gloss unbreakable housewares, and many other items including high-strength packing film.

Maintenance, construction and fabricating services for the petro-chemical plants are provided by the Catalytic Construction Company and Chemical Valley Fabricating Company Limited.

Although the big refineries and chemical industries are Sarnia's mainstay, the city has diversified sources of employment. Muellers Limited makes plumbing supplies; Holmes Foundry and Electric Auto-Lite turn out automotive parts; Sarnia Bridge works with structural steel; Mac Craft operates the only plant in Canada designed entirely for the manufacture of moulded plywood. At the government dock is a grain elevator which stores 5,400,000 bushels of grain each winter and handles the wheat, corn and soya beans from the farming communities about. Also contributing to the city's economy are fourteen other industries producing a variety of goods from ready-mixed cement to soda water.

When it is considered that population has doubled, industry tripled and area quintupled in only ten years, it is not surprising that even lifetime residents feel as if they were now living in some city other than the staid little Sarnia they knew in 1940. In the year that Polymer was built a whole new suburb sprang up near the plant; wartime housing erected another to the east side of the city. The old city, with wartime restrictions and shortages to contend with, was straining at the seams. Attics were cleared and rented. Guest rooms in the spacious



A view of the glycol plant of Dow Chemical of Canada, Limited, at Sarnia. The company is Canada's leading supplier of ethylene glycol, used for the manufacture of antifreeze, explosives, cellophane, synthetic fibres and resins.

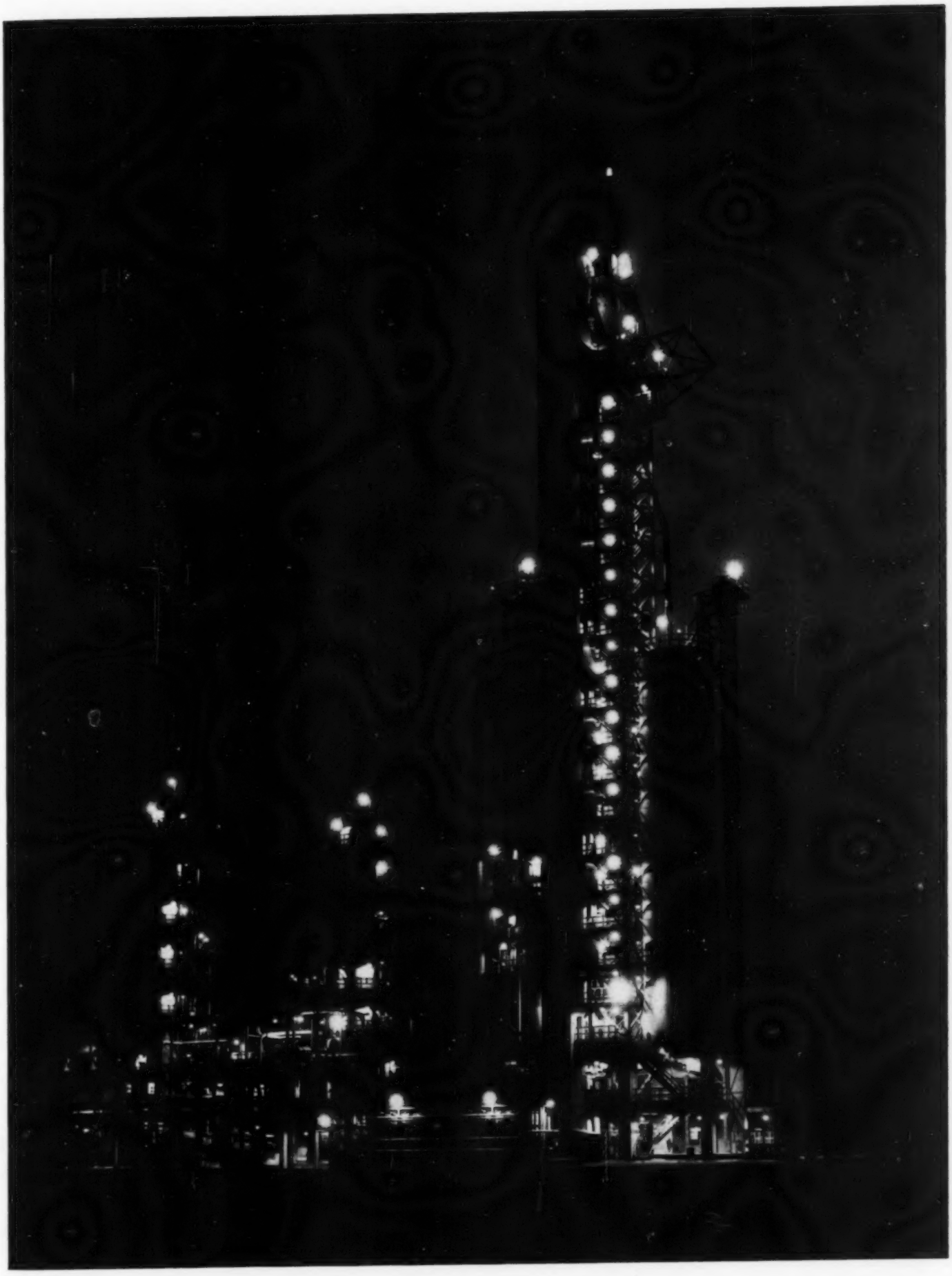
A dramatic study of the Polymer Corporation's plant at night. Malak

old houses were converted into flats. City-wide bus service was instituted. The sisters of St. Joseph were asked to erect a new hospital to supplement the General Hospital. More land had to be acquired and, as there was no natural impediment, the city annexed land to the south, east and north in 1951.

One unusual feature of the annexation was the incorporation of an Indian reservation into the city. The Chippewa Indian Reserve, with 455 people and about 4,000 acres, became part of Sarnia. Indian children began to go to school with white children, an experiment of interest to educators across the country. As the Indian land is valuable for industrial sites, it was recently sold for over $8,000,000, making the Indians one of the richest bands in Canada. At the present time they are planning to move into a model village built on a riverside location on their industrialized reserve.

Although Sarnia has grown so rapidly, it still retains its charming distinction of being a city of one-family homes. From the heart of the down-town area to the farthest suburbs rows of one-storey or two-storey houses stretch along the tree-lined streets. Contributing to this wealth of homes is the economic well-being of the city, the availability of level, fertile land (the city is built on the bed of a prehistoric lake), and the ease with which buildings may be erected. Ease of construction is due to the abundance of materials manufactured in the city or nearby, the large number of contracting firms and builders' supply houses, the readiness with which sewers and other piping may be installed due to the sandy nature of the soil and the mildness of the winters, and the good drainage provided by the gentle fall of the land toward the lake and river. Moreover, the lake provides a clean, clear water supply; electricity

Right:—
The Sun Oil Company plant at Sarnia, constructed in 1953, is supplied with crude piped from Texas. View of the plant at night.
Sun Oil Company



and natural gas are relatively inexpensive. There are many large treed lots, while thanks to the long growing season, fertile soil and other favourable climatic conditions, landscaping is a successful venture.

The home-owners are not the only ones who have landscaped grounds in Sarnia. The big industries combine the beauty of their new functional buildings with beauty of surroundings. For instance, the glazed tile and glass engineering building of Imperial Oil, with its recessed base and modernistic features, is set back from the street on a velvet green lawn planted with clumps of paper-white birch trees. Canadian Oil have given their plant, modern and efficient as it is, a setting such as is associated with Old Country estates. The effect is heightened further by the view of the blue St. Clair flowing by on the west side and a broad stream winding through the grounds.

Far from detracting from the appearance of the city, the big plants have actually enhanced it. At night from the bridge, or the United States side, the lights can be seen sparkling a few feet apart, from the ground up through the buildings, on the spheres, towers, and cat-crackers and reflecting on the ripples of the river.

Sarnia has spacious parks for leisure-time activities to complement her fine homes and big industries. Canatara Park, the largest, is comprised of 262 wooded acres on the shores of Lake Huron. As the park is within walking distance or a short drive from the residential parts, it is a favourite spot for family picnics, swimming and relaxation on the wide sandy beach. Last year 900 children took Red Cross swimming classes there.

As well as Canatara there are twenty-six other city parks, some of which are equipped with bleachers and floodlights for baseball and football games. All are used as supervised playgrounds for children during the summer. Sports events and conducted play for children take place in the winter under cover of the arena, which will accommodate 5,000 persons. Here hockey and ice-skating hold sway from fall till spring.

Other provisions for the leisure of Sarnians are the activities taking place in their new "Y" building. The funds for this building were raised largely by a door-to-door canvass of the city. It was enthusiastically supported and is just as enthusiastically used. Sarnia has more "Y" members for its population than any other city on the continent. There are 4,000 members, made up of twenty-five adult groups, twelve children's groups and ten teen-agers' groups. It is the meeting place of the Little Orchestra Society, the Senior Citizens' Group, Teen Town, and many gatherings that enrich the leisure of city dwellers.

The religious and social life of the city was given a new impetus by the influx of people that the petro-chemical industries attracted here. All churches have had an increase in membership and every leading denomination has had to erect places of worship for the people in the new sub-divisions. Now there are over fifty churches, whereas there were about twenty less than ten years ago. Old clubs formed branches and more clubs came into being to integrate the new-comers into the social life of the city. Adding to the cultural diversity are the scientists and engineers of the new plants who come from nearly every university on this continent and in Europe.

While there are facilities and opportunities for almost every form of indoor and outdoor recreation, perhaps the pastime for which Sarnia is most ideally situated is yachting. There are a large number of yacht club members, owning all manner of small craft from tiny sailboats to cabin cruisers. With a quiet mooring place and Lake Huron and the St. Clair River to navigate, it is understandable that every year sees more boats added to this pleasure fleet.

But Sarnians' activities are not limited to pleasure. Education for both adults and children is an intrinsic part of the city's life. For adults there are university extension classes from September to April and evening classes in matriculation subjects and technical subjects designed to equip the student for local industrial employment. For children there are four secondary schools, twenty-seven elementary schools and one business college. Her schools, mostly new, are among Sarnia's finest public buildings. Largely one-storey glass and brick

structures, they are set on spacious landscaped grounds.

Fulfilling demands for new schools, sewers, streets and all the needs of a fast-expanding community has failed to weaken the city's strong financial position. The City Council has restrained spending except for things that were essential. For such things, enough has been spent to ensure quality but prevent extravagance. Schools are built so that additions can be added. The $2,000,000 General Hospital incorporated the newest wing of the old building. Co-operation between the city and Lambton County is sought for the erection of municipal buildings. Due to this care, the tax rate is fifty-four point seven for 1957.

City government is the city manager, mayor and council type. Half the members of council are elected each year. The mayor is elected for two years. Other elected bodies are the General Hospital Commission, the Hydro-Electric Commission, two boards to oversee education for the public and separate schools, a parks board and a planning board. The latter has drawn up zoning laws to protect residential property.

For the most part nature has been more than kind to Sarnians and their property, but on 21 May 1953 a whirling tornado swept through the town leaving a diagonal band of debris behind it. Top floors were blown off down-town stores, buildings collapsed, cars were crushed, trees were uprooted. The big wind came about six o'clock in the evening when most people were at home. As there was a hailstorm first, everybody was forced under cover, so in spite of falling bricks, crashing trees and flying lum-

Sarnia has excellent facilities for yachting. This is the mooring place for craft belonging to yacht club members.

Sarnia Chamber of Commerce

The Canadian Oil Companies plant occupies 400 acres on the riverside at Sarnia.
H. R. Oakman

ber no one was killed, and very few were injured and those only slightly. Immediately, martial law was proclaimed from the town hall steps. A citizenry, amazed and thankful to be alive, began to clear up its city.

Nothing illustrates better the kind of people who live in Sarnia than their response to the needs that arose as a result of the storm. Largely through the efforts of the many volunteers who gave both time and equipment, the streets were cleared of trees and bricks, and hydro and telephone services restored. A collection was taken up to help those who had suffered losses, and losses were heavy. Not only was there enough money — there was money left over. In the business section, where the storm did its worst, the merchants had great sales to clear their damaged stores of any saleable goods. Workmen moved in and new stores were built and old ones remodelled. Now the Victorian buildings sport modern facades of plate glass. Equally optimistic and practical, the home-owners who lived on the tornado's path repaired or rebuilt their houses and garages. No sign, only an incredulous memory, remains of the furious visit.

Sarnia has its proud memories too. In the years 1914-18 out of her 14,000 inhabitants 1,396 were in the armed forces. Again, in 1939-45, 1,991 of her 18,000 people joined the services.

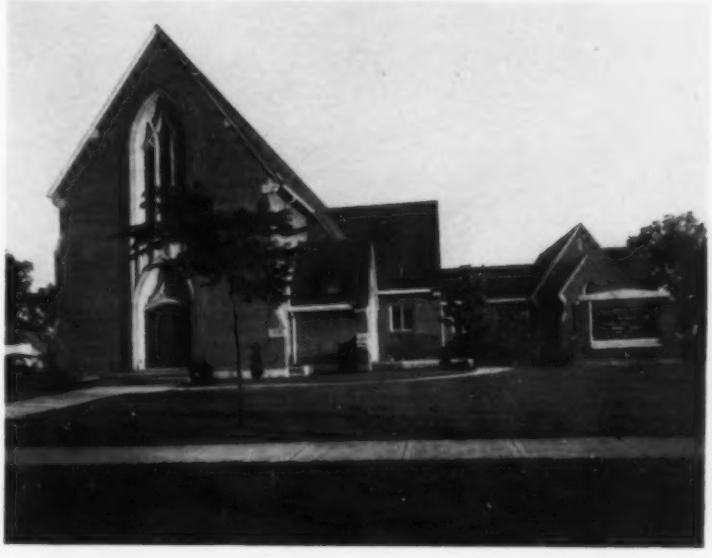
Sarnia also remembers proudly that Canada's second Prime Minister, the Honourable Alexander MacKenzie, came from here. In his home city there are buildings that attest to his good workmanship as a stone mason. More enduring monuments are the Royal Military College, the Supreme Court of Canada and Hansard which he initiated.

One of Sarnia's major political figures of the present time is the Honourable Bryan L. Cathcart, Minister of Travel and Publicity for On-

tario. It is fitting that a Sarnian should have this office, for Canada's "Chemical Valley" is also a summer resort and an important port of entry for American tourists. The lure of her sandy beaches, boating facilities and golf courses attract travellers from considerable distances. A few years back much of the Lake Huron shore-line in the present city limits was devoted to summer cottages. Lately these have been replaced with homes for Sarnians. Very fine homes they are, on shaded lots facing out over the glinting waters of Lake Huron. Now vacationers enjoy their holidays farther out along the lake or in Sarnia's large up-to-date motels.

Last year the Ontario Government erected an English tavern-style reception centre, handsome and well equipped, at the Bluewater Bridge to welcome and assist the tourist with maps, licences, time-tables and — if he so desires — a cup of tea. So far 1,000,000 tourists have been received at the centre.

The regular visitors to Sarnia see amazing changes each year as a twentieth century city is superimposed on a nineteenth century town. Old landmarks are fast disappearing. Even the river will undergo changes before the St. Lawrence Seaway project is finished. A new department store occupies the former site of the town hall; what was recently a market garden is now a busy shopping centre. On the post office land a $2,000,000 federal building is going up. In a few months an erstwhile pasture will contain the largest branch in Canada of a well-known grocery company. But perhaps the story of the city's transformation is best summarized by census figures: her population grew from 18,734 in 1941 to 34,697 in 1951, and by 1956 was 43,447. With her new residents, general expansion and flourishing petro-chemical industry, Sarnia is one of the nation's liveliest contenders for the coveted and elusive title, "Canada's fastest growing city".



At top:—
The tourist reception centre at the Bluewater International Bridge.
Ontario Department of Travel and Publicity

Centre:—
One of Sarnia's new churches. The city now has over fifty.

At bottom:—
Sarnia's General Hospital.
Douglas Paisley Studio

Saheli Bang Gardens. The State of Jaipur in Rajasthan has a beautiful garden with a variety of fountains. Formerly it was reserved for the ladies of the royal family, but now it is open to the public.

In the state of Manipur a special style of dancing was originated. This Manipuri dancer wears a stiff and heavily embroidered skirt, and covers her face with a veil. She is representing the opening of the lotus flower.

Glimpses of Everyday Life in India

Photographs by B. BHANSALI

INDIA has many things to tell us about her way of life, and for those who cannot have the privilege of meeting her people in their own land, the camera in skilful hands may prove a substantial aid. The heat, the light, the sounds, the smells, must be filled in by our own imagination, but, once the prime purpose of a visual presentation has been artistically achieved, it is a powerful stimulant to the overall mental picture. These views show us a happy, and smiling phase of Indian life. People are going about their daily tasks with laughter in their eyes, and we can measure the value of what the pictures tell us by conjuring up parallel scenes in our own land. There is an atmosphere of personal gracefulness evident in the humblest tasks, particularly noticeable in the scene of the fisherwomen of Bombay.

The look of contentment on all the faces shown in these pictures is a more cogent argument than the written word; the Indian method of up-bringing may differ from our own, but if it produces such competent and cheerful workers as the "water maiden" or the "strong man" from the *Chhara* tribe or the dreamy musician with his bamboo *ektaro*, the system is obviously successful. Everyday life in India may have many facets, and these pictures show that vigour, gracefulness, and contentment are part of the lives of ordinary people.

Above:—Bharthari. This is a member of the gipsy tribe found in Rajasthan who earns his living by playing in the streets on his ektaro, *a musical instrument made of a bamboo stick, some pieces of wire, and a dry coconut shell.*

Left:—
This old but sturdy man comes from the community of Chharas *or gipsy wanderers. Now he has settled down, and is head of the camp. He wears a home-made shawl of sheep's wool over a white coat tied with strings.*

Lower left:—
This girl belongs to the Chhara *or gipsy tribe, formerly known for pickpocketing and housebreaking. The Government of India has now undertaken its education and reform. The girl is carrying water in two superimposed metal pots on her head.*

Below:—While waiting for the train, fisher[illegible]omba[illegible] carry on her head. They help[illegible]lies [illegible]

Right:—
Child marriages are now banned by the government, and the law is observed among the better educated, but in the villages the old custom still prevails. A young mother of eighteen with her child, whose head is shaven.

Lower right:—
Boys from Saurashtra, in Bombay State, performing the dance known as dandia ras. *They wear head-dresses of coloured scarves and peacock feathers. They hold brightly painted* dandias *(wooden sticks) in their hands.*

fisherw[omen] Bombay share the load of fish that each will ey help[their] lies by selling fish in the market.

The bicycle-type wheels of early aircraft could not stand the roughness of early twenties fields.

The Story of Canada's Airports

by W. H. VAN ALLEN

Department of Transport photographs

FOLLOWING the successful flights of the *Silver Dart* at Baddeck, Cape Breton Island, early in 1909, J. A. D. McCurdy and his co-partner in the Aerial Experiment Association, F. W. Baldwin, endeavoured to interest the Canadian Department of Militia in their work and approval was finally given for trial flights to be conducted at Petawawa, Ontario, in August of that year. Unfortunately, the available landing areas there had a very different surface from that of the smooth ice at Baddeck. The frail *Silver Dart* could not stand the

rough landings and, after a series of early morning successful trial flights, this aeroplane and a sister aircraft named the *Baddeck I*, both smashed on the rough surface, fortunately without injury to their pilots.

Had a good aerodrome been available, the trials might have had a very different result. Officialdom remained unconvinced of the practical value of aircraft in military work and refused further assistance. The late J. A. Wilson, C.B.E., then Director of Air Services of the Department of Transport, known as the "Father of Canadian Civil Aviation", and a former vice-president of the Canadian Geographical Society, commented on this unfortunate situation in an article published in the *Journal of the Engineering Institute of Canada* in 1937 as follows:—

> "It is unfortunate that the Militia Department refused to take cognizance of McCurdy's and Baldwin's 200 successful flights made under proper conditions and adopted a conservative attitude, based on reports of the trials made from rough ground at Petawawa. Their lack of vision had an influence detrimental to the whole course of Canadian aviation, which is only now disappearing after nearly a generation."

The above quotation indicates to what extent the availability of suitable landing fields has influenced the development of aviation and conversely, the extent to which cow-pasture landing fields have retarded the growth of aviation in the early days when so many budding inventors were having their brain-children wrecked through lack of proper landing facilities. In many cases these improvised aerodromes were nothing but uneven fields, often pockmarked by gopher holes or made dangerous by stones or tufts of turf which crumpled the bicycle-type wheels of the experimental aircraft.

Possibly Canada's first definite attempt to prepare a proper take-off and landing strip was made near Stettler, Alberta, where the Underwood brothers were experimenting with man-lifting kites and sought to have them powered by motor. This first air strip was a smoothed-down stretch, 330 feet by 1,320 feet, along a field of summer fallow. Unfortunately no aircraft ever took off or landed on its hard-packed surface, but the inventors showed an appreciation far ahead of their times of the necessity for smooth surface for aircraft operation.

The First World War and the immediate post-war years of "barnstorming" brought great advances to aviation but left much to be desired in landing fields. Training establishments for Canada's wartime pilots provided

Right:—Even by 1930 all-direction fields were still in use, as tracks on this aerodrome indicate.

Left:—Typical cow-pasture aerodrome of 1923 — dated by the early Fairchild aeroplane and Model-T Ford car.

By 1935, in preparation for the trans-Canada airways system, definite runways had made their appearance.

pasture fields which had been levelled as aerodromes; while barnstorming pilots were lucky if they could find a race track from which to operate. Otherwise they had to use any field available.

In the early post-war years of aviation, the bush pilot came into his own and earned an enviable record for Canada by carrying more freight by air than had been attempted in any other country. These operations were mainly in the northland where landings were only possible on the innumerable lakes. Aircraft were therefore equipped with pontoons in summer and skis in winter.

Inauguration of the flying club movement in 1927 showed a definite trend towards improved airfields. One of the prime requisites for receiving governmental aid in the form of training aircraft was the availability of a licensed aerodrome and adequate accommodation for housing and maintenance of aircraft.

The modern airport is a far cry from its early counterpart and it can be said that it was with the assumption of responsibility for civil aviation by the newly created Department of Transport in 1936 that the modern-type runway was evolved. Since then, runways have had to be extended and strengthened to meet the requirements of increasing weight and speed of aircraft.

The Department of Transport was created with a view to bringing together under one ministry the control and operation of all forms of transportation and communication coming under federal jurisdiction. The Civil Aviation Branch of the Department of National Defence and the Radio and Meteorological Branches of the former Department of Marine were formed into one unit, the Air Services Branch. Other units of the new Department of Transport included Marine, Canals and Railways.

The earlier aerodromes, as they were then called, were in most cases all-way turf fields,

requiring extensive levelling and equipped with hangars, waiting rooms and other buildings before they could be licensed by the government. Aerodromes of the early 1930s saw the first development in the runway system, but it was not until the creation of the trans-Canada airways system in preparation for trans-continental operations, that a definite pattern was set.

With the formation of Trans-Canada Air Lines, the airways system developed by the Department of Transport had assumed a pattern which is still followed today. Airports, as they had come to be known since departing from the all-way turf field previously used, were built on the runway strip principle, by which a system of two or more landing strips 3,000 feet or more long were laid out on the field in the form of a triangle, a tee-square or a cross. The angle of the landing strips was determined by prevailing winds. The remainder of the field was cleared and rough ground only graded.

When the Second World War broke out, the trans-Canada airways system of the Department of Transport consisted of thirty-seven airports of developed dimensions with five additional airport sites capable of being developed to the 3,000-foot runways. In addition, there were some forty-six smaller airports not included in the airways system. The airways system provided a good chain of airports from coast to coast at the required 100-mile intervals with emergency landing fields at closer spacing. These developed airports were equipped with hangar accommodation, lighting, weather and communication services, and radio aids to navigation. Passenger accommodation was provided in some cases.

Under the British Commonwealth Air Training Plan, twenty-four of these existing airports were converted by the Department of Transport for training purposes and an immense programme of construction of new airfields was commenced. During the year 1940 alone, eighty new airports were carved out of raw prairie land, out of farmland and even out of semi-bush country.

Detailed description of the construction of one typical airport at Welland, in Southern Ontario, showed that more than 2,500 trees, roots and all, had to be removed, and approximately 175,000 cubic yards of earth had to be handled in the stripping and grading operations. For the construction of runways alone, equivalent in area to approximately five miles of highway, more than 60,000 tons of crushed stone had to be hauled from a nearby quarry, and 77,000 gallons of primer and bituminous surfacing had to be provided. Approximately eight miles of tiled drains were laid and more than 16,000 cubic yards of open ditching excavated outside of the field. In addition, 140 acres of land had to be seeded.

The above was a typical airport constructed under the British Commonwealth Air Training Plan. In all, some 200 airports were constructed by the Department of Transport during the war years. Types of runway construction differed and the thickness of the pavements depended on bearing quality and the type of aircraft. These varied from five to ten-inch base and from one to two-inch top. Bases consisted in most cases of crushed gravel and stone, with water-bound macadam, while surfacing was with bituminous mix.

The modern airport is a grown-up counterpart of this war-time construction and is a far

Montreal airport's terminal was considered the most modern of its kind when built in the early forties. Now inadequate for present-day traffic, it is being replaced.

With signal lamps, radio and radar, air traffic controllers are policemen of the airways.

cry from the early aerodromes of the late 1920s, when only small municipal fields built for inter-city operations and for the local flying club existed. Even the airports of the early Trans-Canada Air Lines days when 3,000-foot runways were required to accommodate aircraft which did not exceed 20,000 pounds in weight are comparatively insignificant by present-day standards.

Today's airports are required to provide runways of 8,000 feet or more in length to accommodate aircraft ranging in weight up to 135,000 pounds. Long range aircraft of the not distant future for both trans-Atlantic and domestic service are expected to have a gross weight up to 300,000 pounds and will require runway lengths in the 10,000-foot to 12,000-foot range.

Aviation has kept well ahead of Canada's northward trend in economic development. Airports and landing strips have been constructed wherever traffic increased to a point where heavy cargo-carrying aircraft equipped with wheels had to be used instead of lighter aeroplanes. Construction of the North-West Staging Route in 1941 — an epic of transportation difficulties overcome — made possible the later construction of the Alcan Highway and the ferrying of aircraft to the Allies in Western Asia during the war.

Airports have also been constructed at such northern settlements as Churchill, Yellowknife, Norman Wells, Southampton Island, Frobisher Bay, Chimo, Baker Lake, Eureka Sound and Cornwallis Island, while landing strips have been built adjoining the joint

Saskatoon airport's terminal, built in 1955, set the pattern adopted for many other airports.

Canada-United States Arctic weather stations as well as other isolated governmental posts in the northland. In recent months, construction operations on the DEW Line and Mid-Canada Defence Line have necessitated construction of landing fields adjoining the developments to enable shuttle services being established by large cargo-carrying aircraft.

The volume of traffic arriving and departing from the main Canadian airports has increased to such an extent that it has been found advantageous to construct taxi-strips, paralleling the main runways. Aircraft proceeding to or from terminal buildings after landing or prior to take off are thus able to leave the runways clear for the use of other aircraft.

The Department of Transport has always kept the safety factor to the forefront in the construction of its airways system. Not only have the airports themselves been enlarged and the runways lengthened, but the very latest in electronics has been utilized to provide for the safe guidance of aircraft in all weather. The radio range system for the guidance of homing aircraft is being replaced on the main transcontinental airways by the visual omni range; the instrument landing system has been installed at the principal airports for the safe landing of aircraft in inclement weather; and both long and short distance radar is being installed for the control of aircraft on the trans-Canada airways and also for airport approach control.

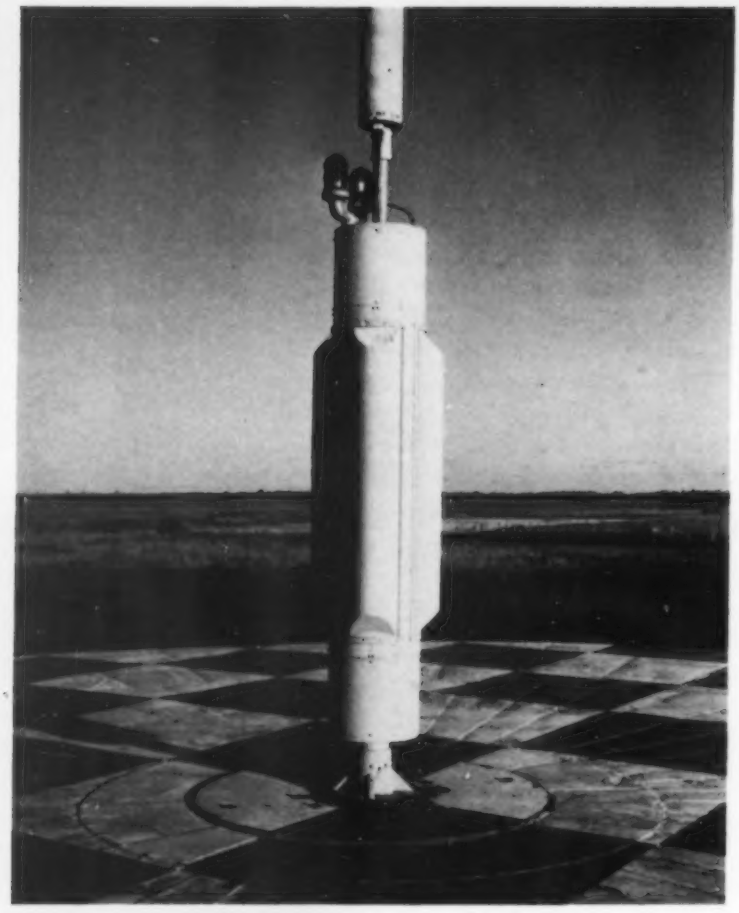
Due to the rapid expansion of airport runways and aids to air navigation on the airways system, the Department of Transport has only in recent years been able to plan terminal buildings more in keeping with the increasing volume of air traffic. The early waiting rooms for passengers, forerunners of the modern terminal buildings, were little more than lean-to's attached to hangars. Passenger planes in the late 1930s carried only ten to twelve passengers and were few and far between, so their arrival did not call for much accommodation. Today's passenger aircraft accommodate from forty to seventy passengers each and a busy airport sees the arrival of many of these aircraft every hour.

Each terminal building has its own requirements based on the frequency of arrival of aircraft, number of passengers handled, and number of friends or relatives coming to welcome passengers or bid them *bon voyage*. In planning each terminal building, Department of Transport architects have had to study carefully the traffic picture of respective airports.

New terminal buildings have been erected in recent years at Moncton, Seven Islands, the Lakehead, Saskatoon, Comox, Sandspit, Stephenville and Quebec City; new buildings are being built at Gander, Montreal, Windsor, St. John's, and Ottawa; while plans are under way for new terminal buildings at Toronto, Regina, Halifax and Winnipeg and also for additional buildings at other airports. In addition, financial assistance has been given by the department in the construction of similar buildings at a number of municipally-owned airports including those at Sudbury, Calgary and Vancouver.

During the current year, airport construction

Frobisher airport, Baffin Island, taken over for civil operation by the Department of Transport from the R.C.A.F. on 1st September, receives its first trans-polar customer.

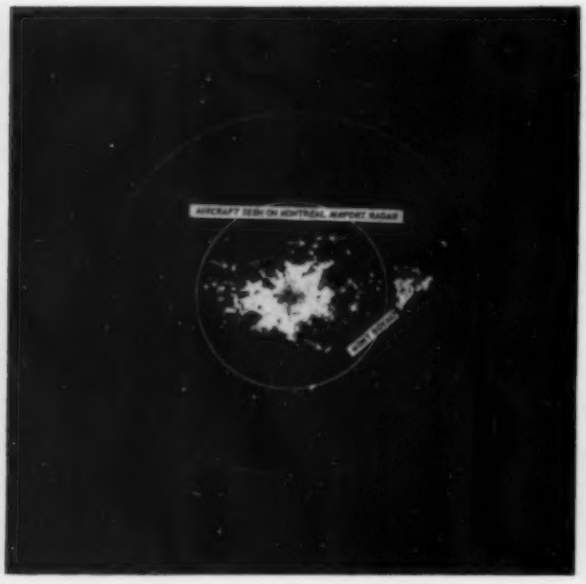


work includes a new airport at Halifax; a start on the new international airport at Edmonton; a new airport on Digby Island to serve Prince Rupert, British Columbia; a new airport at Aklavik, Northwest Territories; as well as completion of runway strengthening and lengthening at Fort Smith, Northwest Territories, Winnipeg, Lethbridge, Fredericton and Moncton.

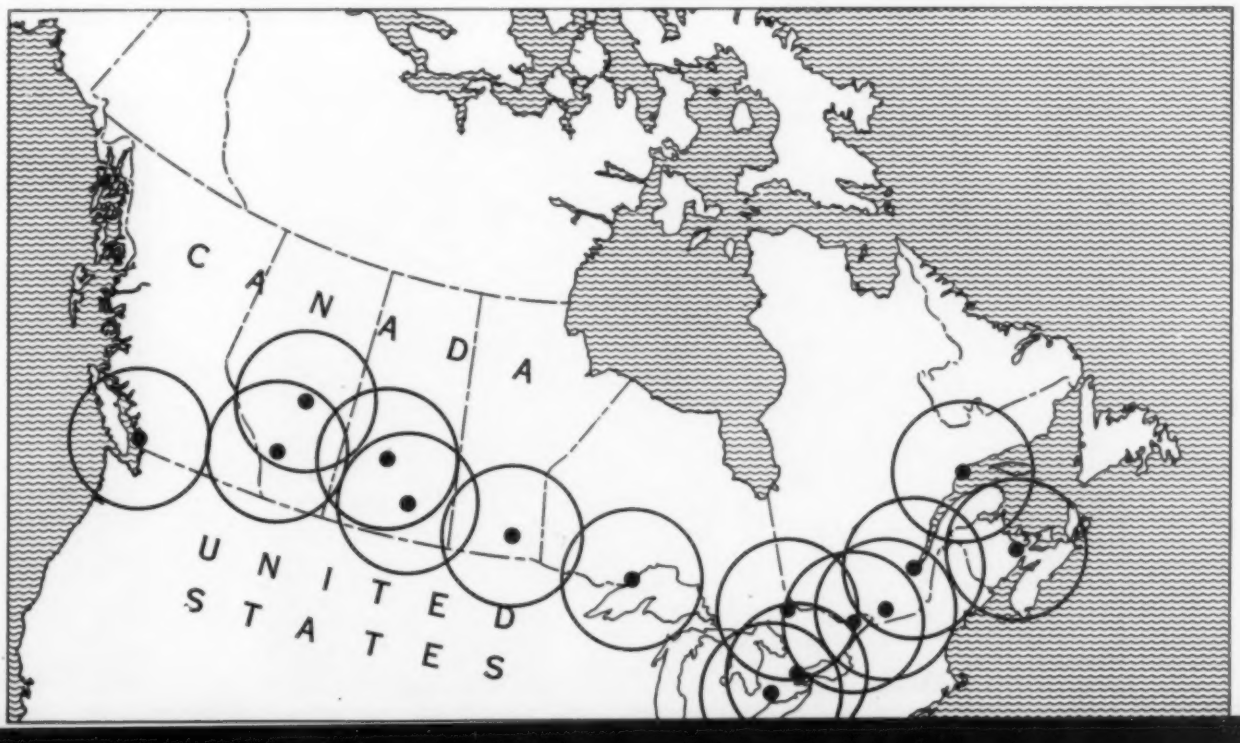
Provision is made in the department's estimates for construction of new airports at Toronto Island, Cornwall, Rivière du Loup, Sherbrooke and Sault Ste. Marie as well as an extensive programme of runways, taxi-ways, and other airport facilities. This is all part of a ten-year programme for civil aviation construction amounting to over $200,000,000.

As recently as 1st September, Frobisher Airport on Baffin Island was turned over to the Department of Transport by the R.C.A.F., to

Electronics and high intensity lighting provide aids to navigation for modern Canadian airways. VOR omnirange (above) registers the exact directional information on aircraft instrument panels. Airport radar (centre below) enables a closer control of aircraft, eliminating time-consuming "stacking". High intensity lights are visible twenty miles away and help landings in inclement weather (left and right below).



Long-range surveillance radar reaches out 200 miles each way to provide a network across Canada (centre and below). Aeroplanes travelling on the main airways can be kept constantly in view on the radarscope (above).



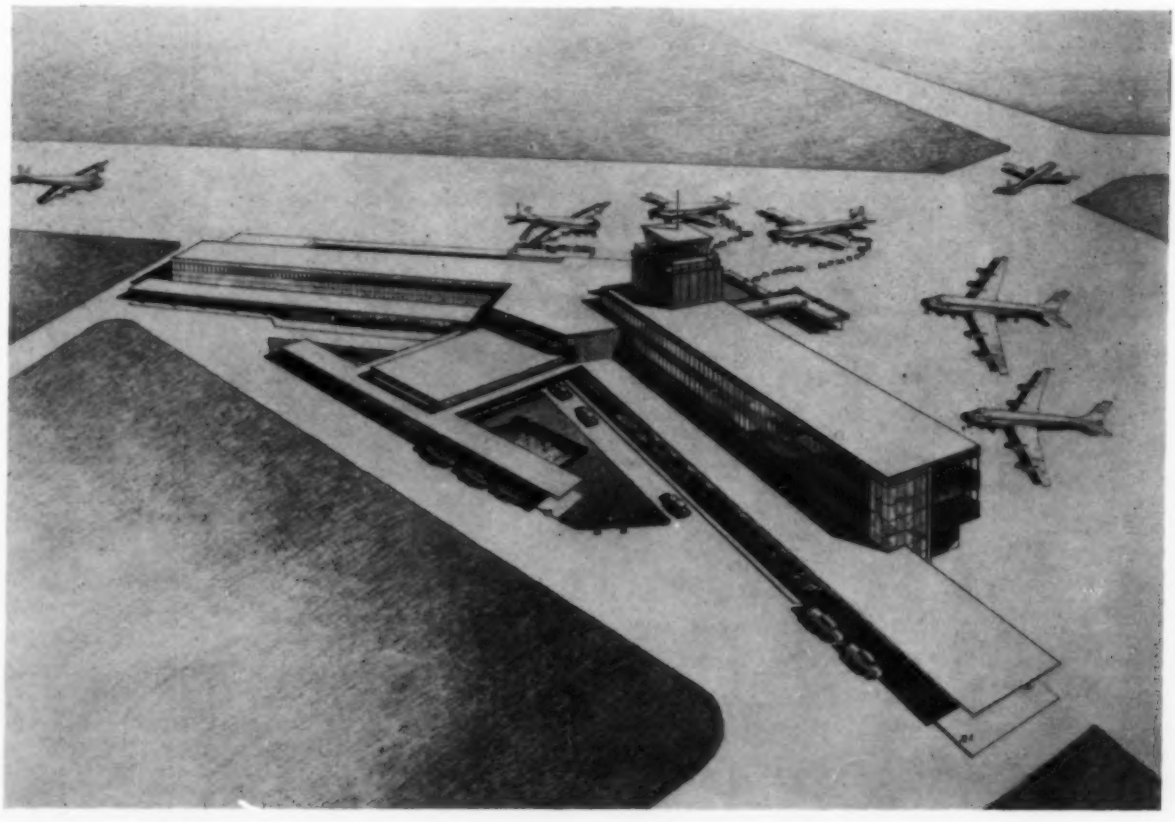
On Canada's easternmost tip of land, Gander airport is well named "cross-roads of the air world.". Gander is a self-contained community with passenger accommodation, restaurant, hotel, laundry, post office and other services, and is able to cope with lengthy stop-overs due to inclement weather or other causes.

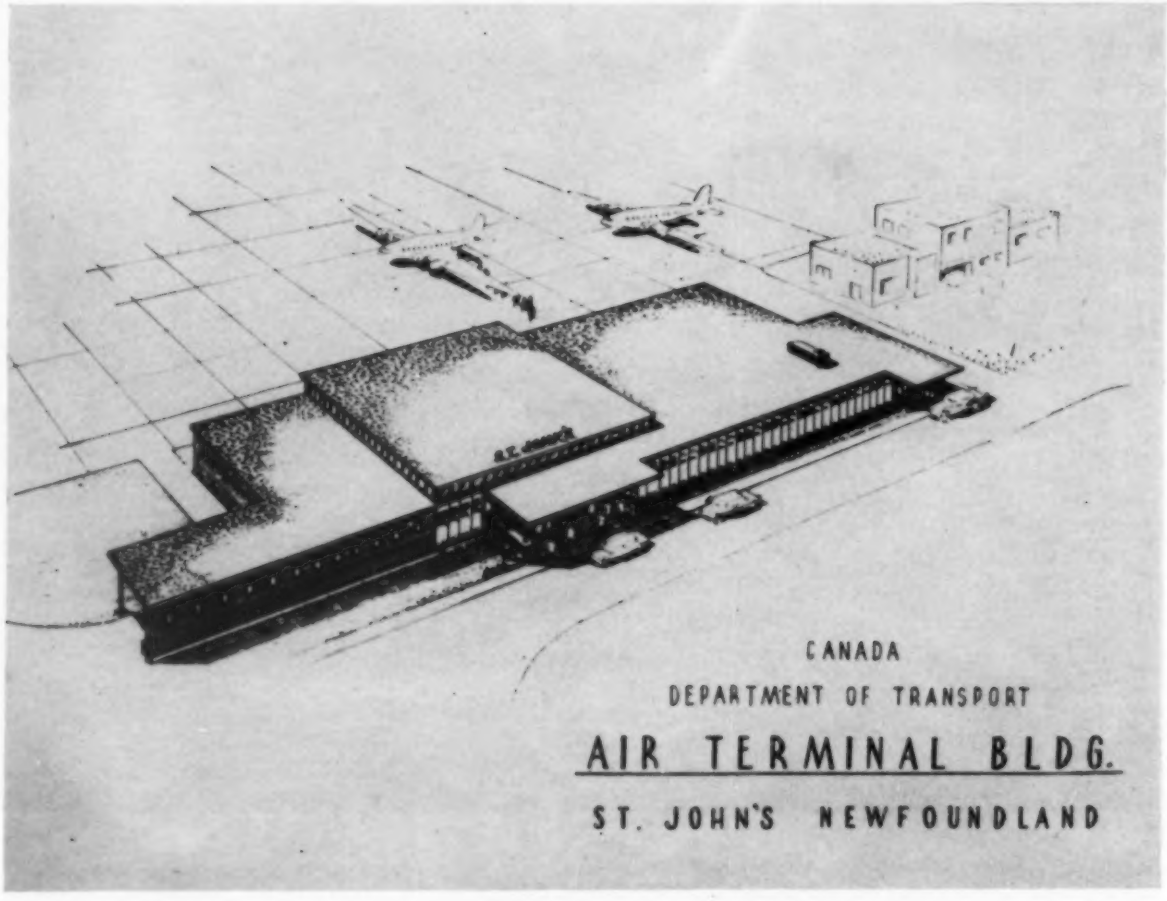
Here people of all races, creeds and customs gather during brief stop-overs — a veritable United Nations, with many languages heard. Aircraft of all nations land at Gander in their inter-hemisphere flights. Here they are serviced, engines checked and the aircraft readied for the continuation of lengthy flights.

be operated as Canada's most northerly civil airport. Less than forty-eight hours after the airport had changed hands, a trail-breaking aircraft of the Pan-American Airline fleet arrived non-stop from the west coast to inaugurate the San Francisco-Paris polar route, while a westbound flight arrived twelve hours later. Frobisher will be a refuelling and jumping-off airport for inter-hemisphere travel by way of the polar route, just as Gander is the main station on the east-west air route across the Atlantic. The runways at Frobisher are being extended to accommodate the largest aircraft on inter-hemisphere flights and construction has commenced to alter the existing hangar and other buildings to provide passenger accommodation.

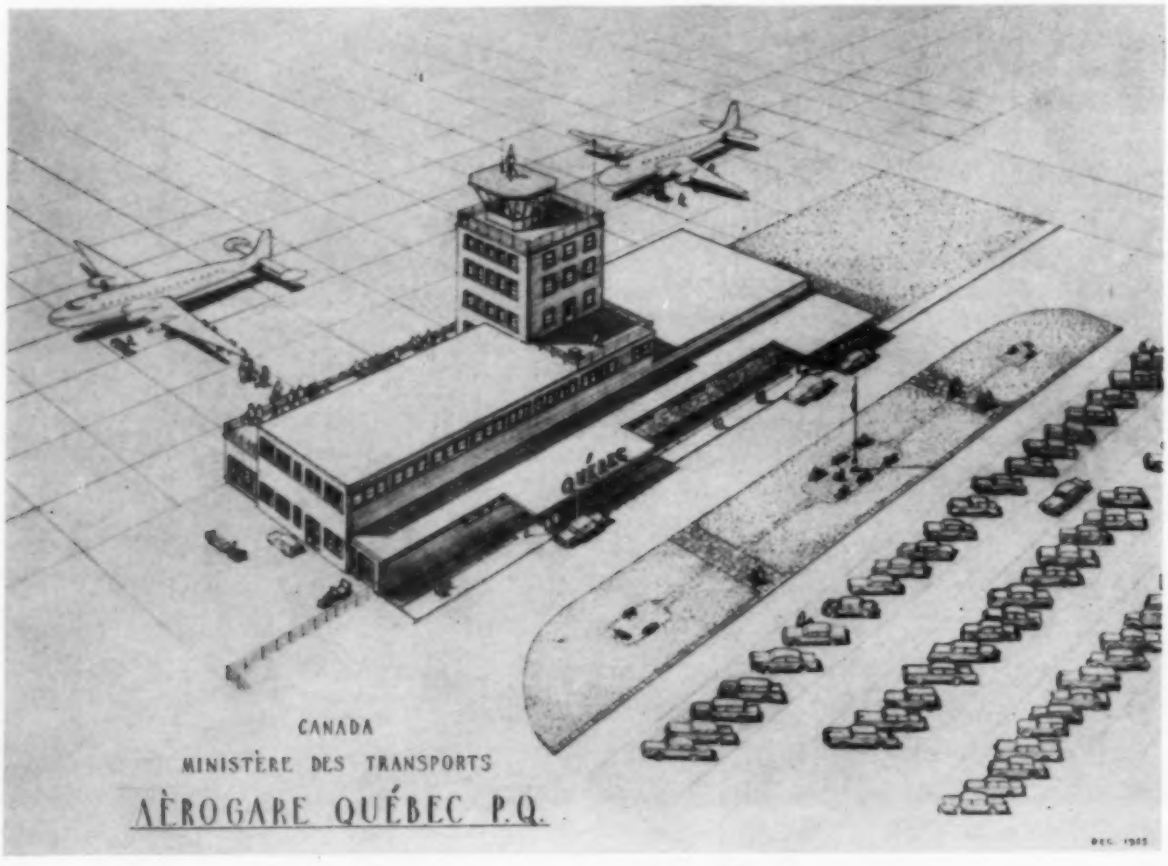
Airport construction has come a long way since early days, with modern equipment and modern methods speeding up work. Above:—temporary control tower erected in mid-field, awaiting construction of a new terminal building. Below:—speeding up laying cement taxi-strips by the alternate strip method.

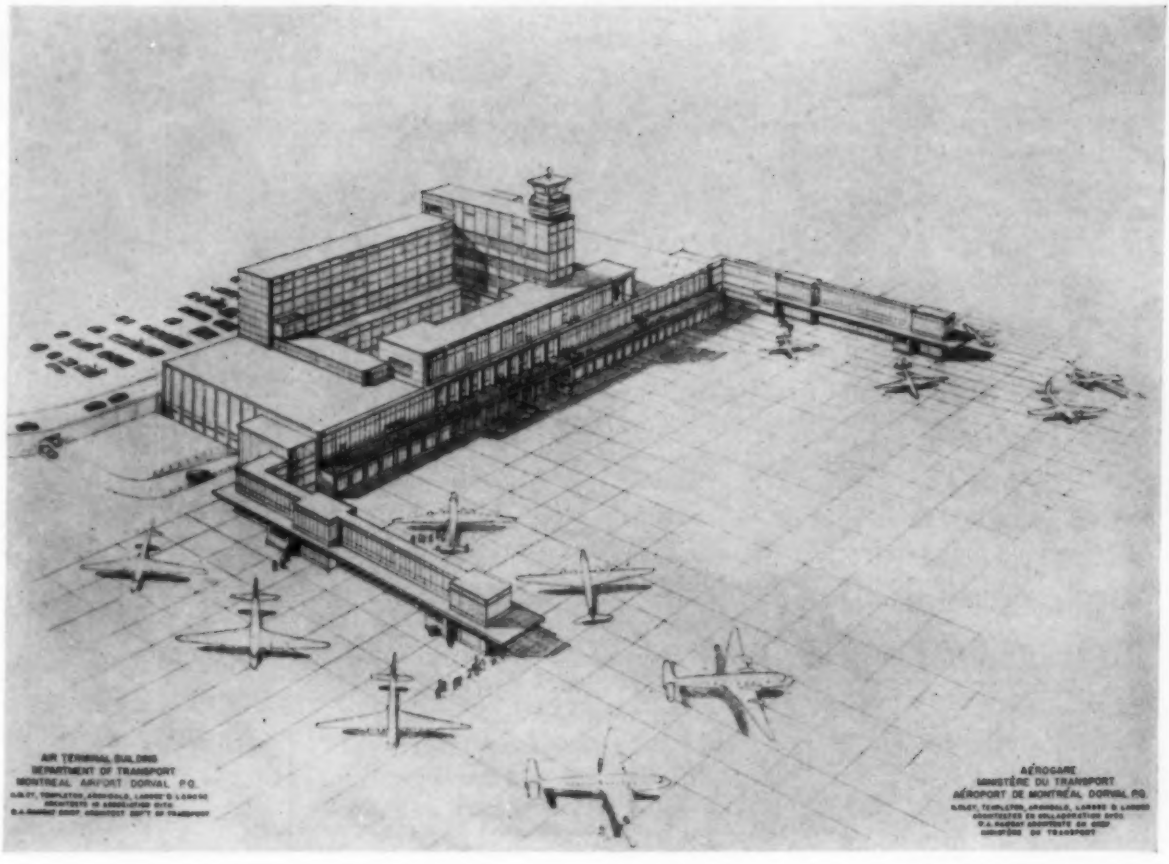
View of Department of Transport development at Ottawa's Uplands airport, with the new terminal building being constructed in centre foreground (above), and an architect's conception of the capital's new airport terminal building.



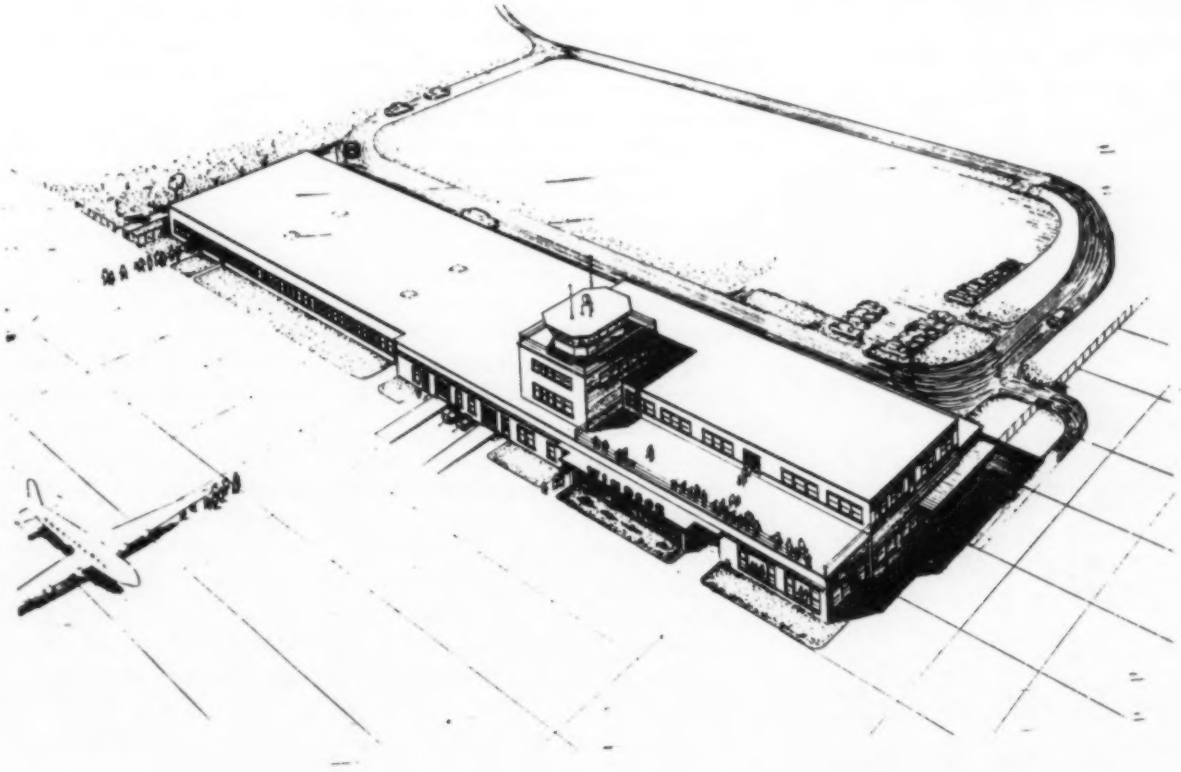


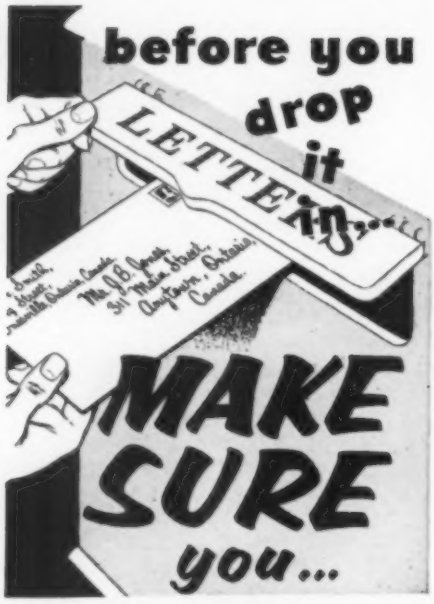
Architects' sketches of airport terminal buildings being constructed at St. John's, Newfoundland (above), and at Quebec (below).





The new Montreal airport terminal (above) will have many times the capacity of the present building, with separate "fingers" to accommodate domestic and international traffic. Windsor airport terminal (below) provides for domestic and international traffic on a smaller scale.





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EDITOR'S NOTE-BOOK

Jean Elford (*Sarnia, Canada's "Chemical Valley"*) resides in Sarnia and has lived in the vicinity of the city most of her life. Mrs. Elford is a graduate of the University of Western Ontario, at London.

* * *

B. Bhansali (*Glimpses of Everyday Life in India*), who lives in Bombay, India, is a skilful photographer with an eye for beauty in ordinary activities and scenes. His striking studies of India and her people have appeared in various publications, including some in the United Kingdom, United States and Canada.

* * *

W. H. Van Allen (*The Story of Canada's Airports*), after spending some time in the service of Canadian Press and Reuters News Agency, in 1928 joined the publicity section of the Department of Trade and Commerce at Ottawa. Since 1940 he has been Chief of Information Services in the Department of Transport. Mr. Van Allen was educated in France and England.

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NATO Fellowships and Scholarships, 1958-9

The North Atlantic Treaty Organization (NATO) is again offering fellowships and scholarships to eligible nationals of its member countries. The program is intended to promote study and research (preferably leading to publication) on various aspects of the common interests, traditions and outlook of NATO countries. Studies are intended to throw light on the history, present status, and future development of the concept of the Atlantic community, and of the problems which confront it. The program is also intended to strengthen the trans-Atlantic ties of the North Atlantic Alliance.

The awards which will be tenable in the academic year 1958-9 are of two categories:

1. Scholarships conferred upon young graduates for a complete university year or for a shorter period. Candidates in this category will receive 50,000 French francs for the entire year (or the equivalent) for studies undertaken in the European countries of NATO, or $2,500 for studies undertaken in Canada or the United States.
2. Fellowships granted to senior scholars for a period of two to four months, the stipend being 200,000 francs per month (or the equivalent). In addition, NATO will pay travel expenses for the two categories of awards.

Candidates must be nationals of the member countries of NATO, and must spend the period of their studies or research in one or more of these countries. Studies should deal with historic, political, constitutional, juridical, social, cultural, linguistic, economic or strategic problems of the countries of the North Atlantic Alliance. Applications should be submitted before 1st January 1958. Final selection of candidates will be made by the NATO Selection Committee in March 1958. Application forms may be obtained from: Awards Committee, Royal Society of Canada, National Research Building, Sussex Street, Ottawa.

THE TRAVEL CORNER

A view of Vancouver's harbour in the late nineteenth century.

L. Frank.

British Columbia's Centennial Celebration

In 1958 British Columbia will have been a province for one hundred years. Elaborate preparations are being made to mark the occasion and to attract as many visitors as possible.

Although forts have grown into cities and rough-hewn trails into smooth macadam highways, there is still a lively pride in the colourful past, its daring explorers, sturdy pioneers, tough sourdoughs and all that attended their days. More than 300 communities are co-operating to provide a program of entertainment for every month of the year. The province's government is contributing $1,500,000 toward this and lasting memorial projects.

During the year there will be at least one major musical festival and symphony orchestras will tour the province. It is also expected that the famous musical ride of the Royal Canadian Mounted Police will be presented at various centres, and that a province-wide tour will be made by the interesting Museum Train owned by Canadian National Railways.

Dr. Margaret Ormsby, History Professor at the University of British Columbia, has been commissioned to write an official history of the province from 1858 to 1958. It will be issued by the MacMillan Publishing Company of Canada next summer. An illustrated book on the province's historic sites is also in preparation and an anthology of the best work of British Columbia authors.

Ceremonies honouring pioneers, gold rush jamborees and re-enactments of events significant in provincial history are planned, too. For instance, eighteen men dressed as voyageurs will journey down the Fraser River from Fort George to Vancouver by Indian canoe, stopping at various communities to participate in ceremonies honouring their great predecessor, Simon Fraser. Their voyage will take about six weeks.

At the invitation of the government, Chief Mungo Martin of the Kwakiutl tribe is carving a 100-foot totem pole commemorating the centenary and recording the legend of the Kwakiutl nation. Eventually it will be presented to Queen Elizabeth II, but a replica will be erected in Vancouver's Stanley Park. Other special projects are a centennial flag and centennial year licence plates for motor vehicles. The Federal Government is making its contribution too — a green and gold postage stamp showing a prospector panning gold and a silver dollar with a totem pole rising out of mountains, which bears the centennial dates.

A great many special sports events have been arranged. In Victoria the Macdonald Brier, the Canadian curl-

(Continued on page XI)

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(Continued from page X)

ing championship, will take place 2-7 March, with the Victoria Curling Club as host. In the same month at Trail there will be the British Columbia junior wrestling championships, followed in April by the senior championships at Quesnel. In May the boxing trials for the British Empire Games will be held. In July the Pacific Coast Yacht Racing Association regatta will take place, with members of the Royal Vancouver Yacht Club as hosts. The Canadian lawn tennis championships are being held at the Vancouver Lawn Tennis Club. Canadian track and field championships, except those for seniors, will take place at Prince George. The popular Kelowna regatta is scheduled for 13-16 August, while the provincial swimming championships will be held 15-16 August at the University of British Columbia's Empire Pool. At Vancouver 25 August-1st September the $50,000 Centennial Open Golf Tournament will take place. The Pacific International Fencing Association tournament is scheduled for the fall, and the Grey Cup football game will be played in Vancouver's Empire Stadium. Also to be held in the province are the junior and senior Canadian lacrosse title matches.

Provincial authorities have launched a campaign to encourage residents to do their travelling within their own borders during 1958. It will not be surprising if many need no urging. And if the well laid plans and publicity prove effective, it seems highly probable that British Columbia will see all of its anticipated 3,000,000 visitors from outside, if not more.

Canadian National Sportsmen's Show, 1958

The eleventh annual Canadian National Sportsmen's Show will be held in the Coliseum at Toronto 14-22 March 1958. There will be some 275 commercial displays covering various phases of sports activity. Special attractions include three international dog shows and a stage and water revue. Brochures and information about reserving space for displays may be obtained by writing to the Canadian National Sportsmen's Show, 85 King Street East, Toronto.

World Tour

Miss Ena L. Yonge, a member of the Association of American Geographers and Map Curator at the American Geographical Society of New York, has announced that she will personally conduct a world tour in 1958. The tour, planned with much care, touches at many points not usually included in itineraries for group travel. A good deal of time will be spent in India, Pakistan and Ceylon.

The group leaves New York on 15 February 1958 for San Francisco and from there travels to Honolulu, Japan, Hong Kong, Macao and Saigon. One of the highlights of this portion of the journey is a visit to the famed Khmer ruins of Angkor Wat in northwest Cambodia. From there the tour continues to Siam, Ceylon, India and Pakistan, with visits to many celebrated places. The last portion takes in Athens and cities in Italy, the Middle East, France and England.

The group returns to New York 18 May. Including tourist class transportation and the United States transportation tax, the cost of the tour is $5,236. A shorter version of it, omitting some European cities and terminating 12 April, costs $4,196. Arrangements can be made to pay for the tour in instalments after taking it. Detailed information may be obtained by writing to Miss Yonge at the American Geographical Society, Broadway at 156th Street, New York 32, N.Y.

Canadian Regional Drama Festivals, 1958

Newfoundland: 7-11 January, place to be announced.
Nova Scotia: 16-18 January at New Glasgow.
New Brunswick: 20-22 January at Sackville.
Prince Edward Island: 24-27 January, place to be announced.
Eastern Quebec: 29 January-1st February at Quebec City.
Western Quebec: 3-8 February at Montreal.
Eastern Ontario: 12-15 February at Ottawa.
Central Ontario: 24-29 March at Toronto.
Western Ontario: 9-12 Apr. at London.
Manitoba: 17-19 February at Winnipeg.
Saskatchewan: 28 February-3 March at Regina.
Alberta: 12-15 March at Calgary.
British Columbia: 17-20 March at Chilliwack.

AMONGST THE NEW BOOKS

Byzantium and Istanbul

by Robert Liddell

(Clarke Irwin, Toronto. $5.00)

A turbulent history has been that of Byzantium—or New Rome, or Constantinople, or Istanbul. Founded by Byzas of Megara as a small Greek settlement in 657 B.C., it did not come into prominence until Constantine the Great decided to transform it into his Eastern capital in A.D. 330.

(Continued on page XIII)

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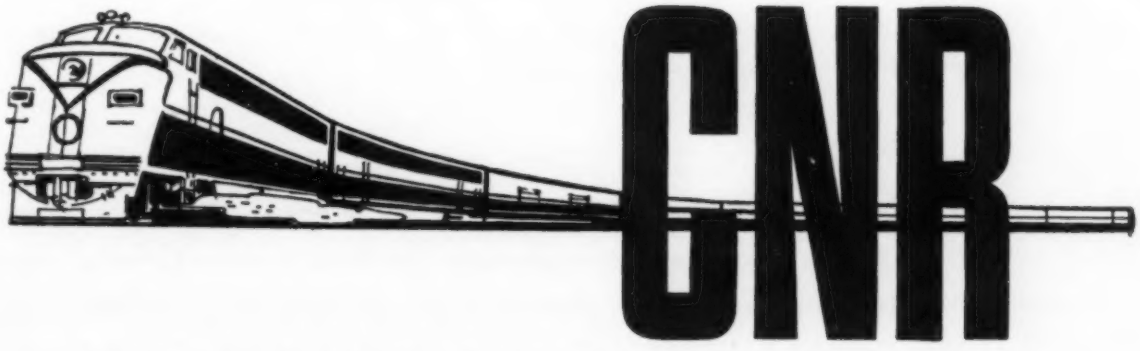

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perors or Sultans. There would have been far more had it not been for the convenient custom of blinding and throwing into forgotten dungeons all Imperial pretenders, or, under the Moslems, of murdering all but one male offspring of the ruling Sultan. To ensure freedom from argument, Mehmet III had nineteen brothers strangled, seven concubines drowned because they were pregnant by them, and his seventeen sisters died rather mysteriously shortly afterwards in the course of a plague. (It was the custom to "sublimate" inconvenient women by drowning them in a weighted sack off Seraglio Point. A diver is said to have gone mad when he discovered a sea of upright bodies, weighted at the feet, weaving about in the currents like underwater ghosts). Violence was everywhere, and seemed to cause little concern, except, presumably, to the victims. There were said to be 50,000 executions a year under Mehmet IV. What mattered loss of life when slaves and captives could be brought in to replace the departed?

Mr. Liddell's book is meant not so much to outline the history of Constantinople as to describe and reconstruct in words from contemporary documents its monuments both past and present. To do this he must necessarily explain the history surrounding them and the circumstances leading to their construction. To do this within the compass of 239 pages is in itself a feat of condensation requiring no little ingenuity; it is in addition replete with references and quotations from observers in all ages of the city's history, and is marked with superior erudition and technical knowledge.

It is perhaps because of its scope within a relatively concise framework that the book is difficult to read. One becomes bewildered and confused by the maze of names and events and descriptions which follow each other at a breathtaking pace. Mr. Liddell is far surer of his ground in dealing with the city after it was conquered by Mehmet II from Constantine IX in 1453. It is evident in the first place that he is bent on demonstrating that Islamic artistic conceptions had not only validity but beauty which should not be neglected merely because of over-emphasis on Byzantine art and influences: but the text in this case is also accompanied by excellent photographs of the remaining monuments of the period.

Confusion on the part of the reader is somewhat compounded by the fact that individual monuments are treated within the context of the different periods discussed, and often by the different names they bore at those particular periods. Thus the Church

(*Continued from page XI*)

From that moment until the overthrow of the last Sultan, Abdul Hamid II, and the creation of the Republic by Kemal Ataturk, it remained a capital city, sometimes in name only, sometimes the capital of the Roman Empire, extending its sway as far west as the Atlantic, sometimes the seat of the Ottoman Empire and dominating the whole of North Africa to the south, the whole of the Moslem world as far as Persia to the east.

Always it has been the centre of strife—the field of battle between East and West, between Moslem and Christian, between Christian sects among themselves, between dissident factions within the Roman Empire. It has been ruled by iconodules who created great figurative monuments, and by iconoclasts who disfigured or destroyed them. It has been the victim of civil insurrection, of invasion from East or West, of great fires, great earthquakes, great plagues, of pillage and vandalism. Until 1908 it remained the citadel of feudal autocracy in the West, as Saudi Arabia remains so to this day in the East.

In the 1,500 years of its glory, Constantinople had some 160 Em-

A PERMANENT RECORD OF THE ROYAL VISIT—1957

The December 1957 issue of the Canadian Geographical Journal will contain a beautifully illustrated report of the visit of Her Majesty the Queen and H.R.H. the Duke of Edinburgh to Canada and the United States.

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of Divine Peace is treated under Constantine, the Church of Holy Wisdom somewhat later, and it is only by deduction that the reader learns that they were later combined to form The Great Church, which in turn became St. Sophia. A more assimilable method would have been to give a general historical summary and then to discuss the development of the various monuments throughout their history, as was done insofar as the Moslem monuments were concerned.

This is a criticism of presentation, not of content. The descriptions of existing monuments or ruins is masterly, and would be of inestimable value to the present-day traveller. There is also a wealth of legends and historical allusions which would warm the heart of any scholar. Who would know, for instance, that the phrase "born in the purple" derives from the fact that a porphyry-lined chamber in the Great Palace was set apart for the lying-in of the Empresses; hence, those born in the chamber were called porphyrogeniti, after the colour of the stone (the Oxford Universal Dictionary *has* a reference to this, but who is likely to have looked it up?)

Finally, it is good to know that, despite their present dilapidation, some restoration work is proceeding under the Byzantine Institute of Boston. It is to be hoped that further assistance will be available in order to accelerate such work and at least forestall further deterioration.

JAMES P. MANION.

Mr. James P. Manion is assistant director of the Economic Planning and Development Branch of the Trade Commissioner Service.

* * *

The Golden Eagle
by Seton Gordon
(Wm. Collins Sons & Co. Ltd., Toronto, $3.50)

Seton Gordon has lived for fifty years in, or within walking distance of, golden eagle country in the Highlands and Islands of Scotland. This book is not only the record of countless hours of eagle-watching by the author and his wife, who has shared his tireless enthusiasm, but also a compendium of golden eagle lore supplied by the author's correspondents all over the world.

The essence of the book is in the story of the Gordons' patient observations of eyries and their occupants. Several chapters recount eight years'

(*Continued on page XV*)

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(*Continued from page XIV*)

observations at one eyrie—surely an outstanding record of continuous study of individual birds. On occasion their persistence necessitated the author and his wife alternately standing watch for ten hours or more in their cramped, heather-covered blind, enduring the frequent, raw discomfort of the Highlands in spring. During their vigils they carefully noted the behaviour of the parent birds during incubation and brooding, and the actions of the growing eaglets, as well as the occurrence of other animals within the eagles' territory and the ever-changing pattern of the seasons. Such is the wealth of detail presented in this book, that the reader may easily feel as if he were the observer.

Thus the book is a bird-watcher's delight: it is not, by the author's admission, intended to be a scientific account of the golden eagle's life history. Perhaps no person, having been so long familiar with such a noble species, could take a wholly dispassionate view of it. Seton Gordon's admiration of golden eagles is apparent on every page. Nevertheless it must be noted that he does not fail to record all observations that have come to his attention, including those popularly considered to reflect little credit on the bird. The chapters on food and hunting habits of the golden eagle contain descriptions of attacks upon lambs and deer calves, as well as abundant evidence that, in the Scottish Highlands, mountain hares and rabbits are the eagles' staple diet.

Although the biologist, noting the author's warmly personal style, might wish that the book were organized in a manner more scientific, and the data in it presented with due regard for statistical significance, he should not conclude that it contains no grist for his mill. There are facts a-plenty here, and no student of raptorial ecology should fail to read *The Golden Eagle.*

Appendices contain James Fisher's opinions on the subspecies of golden eagles, and the author's brief notes on the status of the species in countries other than Scotland. Fisher has also contributed a map of the breeding distribution throughout the world. There are a number of excellent photographs, many of them taken by the author. A bibliography, containing ninety-seven titles, concludes the volume.

DAVID A. MUNRO.

Mr. David Munro is chief ornithologist in the Canadian Wildlife Service, National Parks Branch.

Water for America

by Edward Graham and William van Dersal

(Oxford University Press, Toronto. $3.50)

This book presents a most vivid picture of the place which water occupies and should occupy in the life of America. It uses modern techniques of presentation and is therefore unusual in that it consists of full-page photographs on alternate pages, with one page of text facing each photograph. The text is concise and interestingly written. The photographs add a pleasing touch to the volume, even though some of them present scenes rather far removed from the textual matter. This is inevitable, however, since each page deals with one specific topic. Topics range from the use of water for washing to weather forecasting, water erosion, water for wild life and the deserts.

These details of presentation are mentioned since the format of the book is unusual and yet pleasantly attractive. What is not clear is whether the book is intended for an adult audience or for young people. There is nothing in the text to suggest that a young audience is intended. If, therefore, the book is meant for adult readers it

(*Continued on page XVII*)

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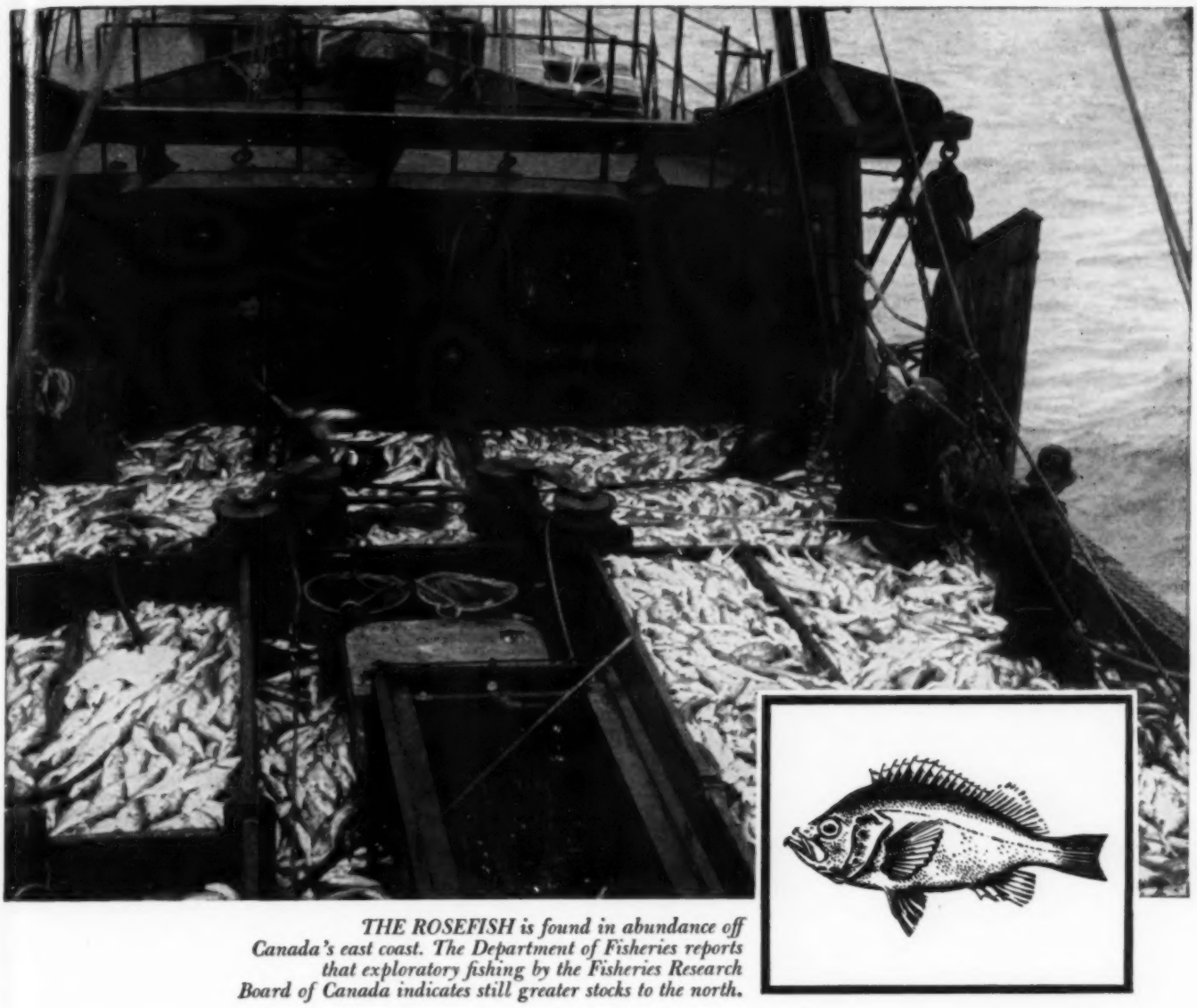

THE ROSEFISH is found in abundance off Canada's east coast. The Department of Fisheries reports that exploratory fishing by the Fisheries Research Board of Canada indicates still greater stocks to the north.

A rose is a bream is a perch—

THE ROSEFISH, variously called Red Bream and Ocean Perch, was, until recent years, of little or no commercial or food value. Turning point in its importance came with advancements in fish freezing and handling. The rosefish were automatically scaled and filleted, then quick frozen and sent to market as Ocean Perch. Their mild flavour and relatively low price won them instant popularity.

At the same time the growth of *otter trawling* with huge, open-mouthed nets made the catching of rosefish in large quantities a commercial possibility.

The Fisheries Research Board of Canada, the Department's scientific arm, has discovered many of the important grounds which are being fished today and others still untapped. The rosefish typifies the role—one of many—that the Department plays in developing Canada's vast and valuable fish resources.

Virtually all the rosefish catch is filleted and quick frozen. The by-products are made into high-vitamin-content meal and oil.

DEPARTMENT OF FISHERIES
OTTAWA CANADA

DF-17 HON. J. ANGUS MACLEAN, M.P., MINISTER GEORGE R. CLARK, DEDUTY MINISTER

(*Continued from page XV*)

is a little sobering to think that so vital a topic has to be presented in so simplified a manner in order to be acceptable.

The subject of the book is of absolutely vital importance to the future well-being of this continent and yet is one of the most neglected of all subjects in the public's mind. Without adequate supplies of water, life would cease to exist. This continent has still so far to go in connection with proper water conservation and control that the book under review is to be welcomed and can be commended without reservation as a splendid introduction for those who have yet to realize the importance of water to every individual on this continent.

Despite the brief text much interesting and useful information is presented. One of the most surprising items is to be found on page twenty-nine, where it is observed that all but two per cent of the 20,000,000 tons of fish caught every year in the sea come from the Northern Hemisphere. Only one slight error was noted, this being a Maritimes reference (page twenty-seven), where the highest tide is stated to be fifty feet in the Bay of Fundy. It has recently been found that tides exceeding sixty feet are experienced in the far northern water of Canada.

This book has special relevance to Canada since, although this country has a greater area of fresh water than any other country in the world, it is far behind other countries in paying proper regard to the conservation of its water resources and their proper utilization. The recent establishment of the Ontario Water Resources Commission is one of the most far-sighted steps yet taken in any country regarding the control of water but it is only a beginning. Meetings to be held later this year will do something to focus public attention on the national importance of water. To all such considerations *Water for America* provides a splendid and vivid introduction.

R. F. LEGGET

Dr. R. F. Legget is director of the Division of Building Research at the National Research Council.

* * *

Autumn Across America

by Edwin Way Teale

(Dodd, Mead and Company (Canada) Limited, Toronto. $6.50)

In previous books Teale has taken us from south to north in the eastern states; Peterson and Fisher (*Wild America*, 1955) have taken us round the perimeter. Now the journey is across the northern states, by a route usually regarded primarily as a means of reaching one coast from the other. One can drive across the continent and see nothing but good roads or bad roads. Or one can take months over it, as the Teales do, and see countless aspects of nature and meet interesting people. In covering much the same ground not so long ago, my journey was something between these extremes. There were many stops to look at a flower, watch a bird wheeling overhead, or scramble among the badlands, but much of interest was missed through lack of information. Had this book been out then, it would have been different. Teale has eyes to see and he can tell where to look for those things that will absorb a nature lover. Such a book is a treasure for the traveller and a delight for the stay-at-home who can enjoy so much vicariously through graphic description and excellent photographs. For appearance's sake, it is a pity that when more than one photograph is used on a page a more definite separation is not made.

The autumn journey has not quite the lilt of the spring journey, perhaps because the season cannot be followed with the same continuity and memories of other years must round out the picture. But there is great variety, for the author finds his season beneath the waters, diving among the eelgrass off Long Island, in the air, for bird migration plays a big part, and on land that ranges from corn field to rain forest. Only in one place was no life to be found, on the Great Salt Lake Desert. Yet before this barren wasteland was left, migrating butterflies were encountered.

It is a book made up of the little things that are so apt to be overlooked: butterflies wintering in trees, otters in the surf, gathering the fern fronds used by florists, tumbleweeds in the wind, and the flaming eastern woods. One would almost gather that New England has a monopoly on the vivid colours of fall, which are one of the glories of eastern Canada. But Canada does not enter into this book, unfortunately, except for a day at Point Pelee to see the migrating birds and butterflies, and a jaunt across the line to Vancouver, British Columbia.

Teale does more than observe — he explains, without lecturing (though he never explained what a hellgrammite is), and he takes us to meet interesting people. He shares his own enjoyment of his journeys with the reader, so that by the end of the trip he is a friend. To travel in such company is a delightful experience.

M. FELTON

Miss M. Felton is a free-lance writer who has travelled widely in North America and Europe.

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